MACWORLD

February 1987 $3.95
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The Macintosh™ Magazine

Laser Fonts

Everything on buying, installing, printing

- Portables
  The New Laptops
- The First Really Useful
  E-Mail System
- Tax Tools
  8 Easy Ways To Save
- World Class Contest
  Win a Mac!

NEW!

Turbo Pascal for the Mac: incredibly fast and fully integrated!

Borland's new Turbo Pascal for the Mac™ is so incredibly fast that it can compile 1,420 lines of source code in the 7.1 seconds it took you to read this sentence.

And reading the rest of this page takes about 5 minutes, which is plenty of time for Turbo Pascal for the Mac to compile at least 60,000 lines of source code!



Turbo Pascal for the Mac does both Windows and "Units"

The *separate* compilation of routines offered by Turbo Pascal for the Mac creates modules called "Units"—which can be linked to any Turbo Pascal® program. This "modular pathway" gives you "pieces" which can then be integrated into larger programs. (You build the "pieces" once, and you know they work, so you can use them again without having to recompile.) The immediate benefits of this technique are a more efficient use of memory and a reduction in the time it takes to develop large programs. (What you need to run Turbo Pascal for the Mac is 256K minimum—or half a Fat Mac, 1 drive, and the ability to handle astonishing speed.)

> "The timing of Turbo Pascal for the Mac couldn't be better. The recent success of the Macintosh in business and its continuing momentum in higher education coincide well with the introduction of Turbo Pascal for the Mac. Turbo Pascal is already an industry standard in the IBM-compatible world, and we're very excited to see Borland International's new commitment to provide this and other modestly priced, high-quality software for the Macintosh computer.
>
> **John Sculley, Chairman, Apple Computer, Inc.**

> "Turbo Pascal has become the language of choice at major educational institutions around the country, and more than 500,000 copies of the IBM PC version have been sold. We believe that Turbo Pascal for the Mac is the ideal educational and professional programming tool for the Macintosh.
>
> **Philippe Kahn, President, Borland International**

Turbo Pascal for the Mac is so compatible with Lisa® that they should be living together

Routines from Lisa Pascal,™ Macintosh Programmer's Workshop Pascal, and Inside Macintosh can be compiled and run with only the subtlest changes. Turbo Pascal for the Mac is also compatible with the Hierarchical File System of the Macintosh.™ (You can define default volume and folder names for the names used in compiler directives.) Compatibility is also familiarity, and you'll feel right at home with Turbo Pascal for the Mac because it fits neatly into every aspect of the Macintosh environment. The pull-down menus are there, along with dialog boxes to guide you in making choices and picking options.

Turbo Pascal for the Mac cranks out more than 12,000 lines a minute

Better than *12,000 lines per minute* of compiled source code race out of Turbo Pascal for the Mac. There is definitely "No Waiting." And none of the "stop/start" compiling delays that afflict some of the software programs that we're not mentioning here. (They can take 10 minutes to do what Turbo Pascal for the Mac can do in 10 seconds!)

You don't spend a lot of up-front time learning to use Turbo Pascal for the Mac. It's as *easy* as it is *fast*—which is not to say that it's over-simplified or written for people who have recently learned to walk erect. Instead, it's electronic proof that sophistication and complication don't need to go hand-in-hand.

In all software, there's the Hard Way, the Wrong Way, the Weird Way, the No Way, and the Borland Way. Welcome to the Borland Way!

How to walk and chew gum!

Turbo Pascal for the Mac lets you do up to *8 different things at once*. You can have up to 8 separate programs in memory, work on one, move on; work on another, move back—or duck and weave between all 8 at the same time! And you can do these 8 Easy Pieces *while you run* the compiler. Multiple editing windows allow you to edit, compile, and execute each window individually. With several windows open at the same time, you switch from one open window to another faster than a cat burglar—and never get caught. It's "take the source code and run!"

The 27-Second Guide to Turbo Pascal for the Mac

- Compilation speed of more than 12,000 lines per minute
- "Unit" structure lets you create programs in modular form
- Multiple editing windows—up to 8 at once
- Compilation options include compiling to disk or memory, or compile and run
- No need to switch between programs to compile or run a program
- Streamlined development and debugging
- Compatibility with Lisa Pascal and Macintosh Programmer's Workshop Pascal (with minimal changes)
- Compatibility with Hierarchical File System of your Mac
- Ability to define default volume and folder names used in compiler directives
- Search and change features in the editor speed up and simplify alteration of routines
- Ability to use all available Macintosh memory without limit
- "Units" included to call all the routines provided by Macintosh Toolbox



Clear your desk, SideKick's here!

SideKick® brings true desktop management and communications to your Mac. Now you can automatically dial phone numbers, log on to bulletin boards, schedule appointments, jot down notes, calculate business expenses—and more—while running all your other Mac software. Once you get SideKick you'll wonder how you ever did without it!

See order form on right-hand page ▶

Introducing Reflex for the Mac, NEW! Borland's remarkable new relational database

Because it is a truly relational database, Reflex for the Mac™ lets you get your various acts together. Lets you connect "A" to "B" to "C," or "Dog" to "Cat" to "Fight." Or whatever links and connections you need to make and need to see. It's a simple spreadsheet-style series of electronic and visual cross-references. There's a clear connection (which you first make by drawing it on-screen) between "Client"—"Matter"—"Attorney"—"Time Sheet"—"Expenses" and "Bill." Or between "Slow Driver in Left-Hand Lane"—"Mile-long Traffic Jam" and "Shot from Behind." It's all relational.

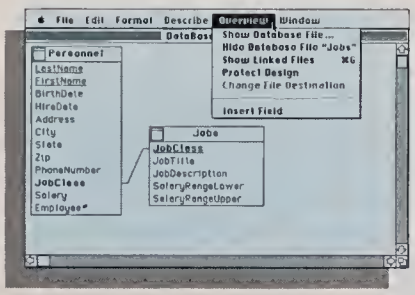
Designed to make the most of your Mac's visual talents, Reflex for the Mac lets you place fields and pictures wherever you want them on the page—and print them that way with your Report Generator.

A funny way to use Reflex for the Mac

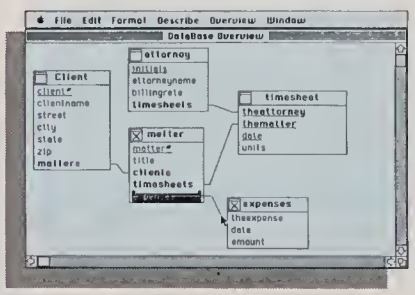
Let's say you have to make a lot of speeches and you like to tell jokes, but can't always remember the right one for the right audience at the right time. So you use Reflex for the Mac to set up multiple files that all connect to each other.

Your "Joke" file connects to your "Audience" file, which is split into categories like "Friendly," "Hostile," "Dumb," "Student" or whatever—all of which are interconnected and relational. Reflex for the Mac lets you find the right joke for the right audience, right now.

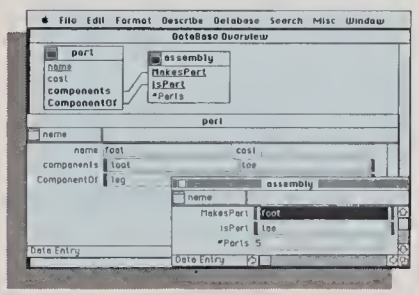
(The serious sides of business include applications like client billing, stock portfolio management, tax planning, and your checkbook.)



After opening the "Overview" window, you draw link lines between databases directly onto your Macintosh screen.



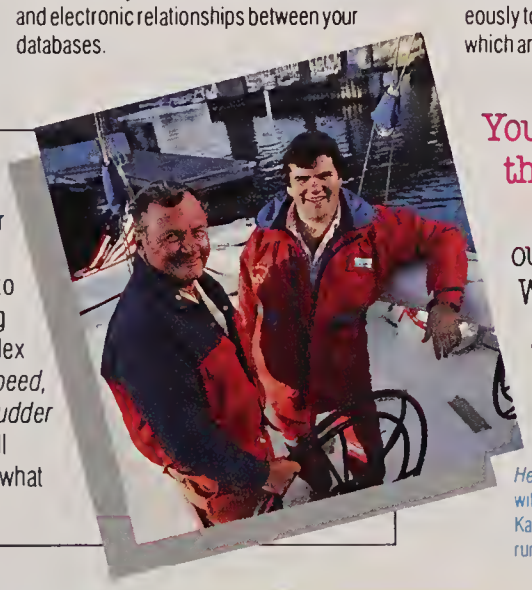
The link lines you draw establish both visual and electronic relationships between your databases.



You can have multiple windows open simultaneously to view all members of a linked set—which are interactive and truly relational.

Mac News for Kangaroos!

Heart of America, one of the U.S. 12-meter contestants in the America's Cup races in Australia, is relying on Reflex for the Mac to help *Bring The Cup Up*. (They're also using Borland's SideKick and Turbo Pascal.) Reflex analyzes 20 different variables like *wind speed, heel angle, backstay load, trim tab angle, rudder angle* and 15 other criteria to show and tell *Heart of America* where to be when—and what to do now to win!



Heart of America's skipper Buddy Melges with Borland International's skipper Philippe Kahn on a testing, training, and analytical run, Santa Cruz, California

You need Reflex for the Mac

Get some Reflex action out of your Mac. Call now. With Reflex for the Mac, you'll have all the right connections—for only $99.95!

> "Really uses the visual strength of the Mac to produce a database design tool
> *Adam Greene, InfoWorld*
>
> . . . a stunningly wonderful application generator/dbms
> *Esther Dyson, Release 1.0*
>
> Bridges the gap between the pretty programs and the power programs
> *Stewart Alsop, PC Letter*"

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If within 60 days of purchase you find that this product does not perform in accordance with our claims, call our customer service department and we will gladly arrange a refund.

Minimum system requirements:

Turbo Pascal for the Mac: 256K. Reflex for the Mac: 512K. SideKick for the Mac: 128K.

M52

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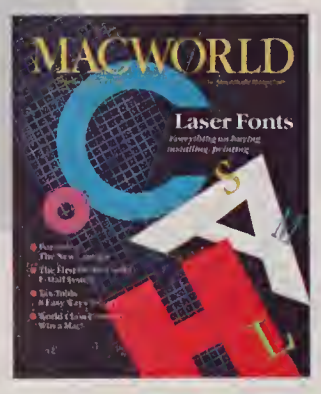
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MACWORLD

February 1987

The Macintosh™ Magazine



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LIGHTSPEED PASCAL™
THE FUTURE REPEATS ITSELF.

JANUARY 1984. (Cupertino, California.)—Apple introduces the Macintosh.™ At the press conference, six software developers, including Microsoft and Lotus, announce their commitment to the new machine. Among them is THINK Technologies, a start-up developer of advanced systems software.

THINK announces Macintosh Pascal. It is a breakthrough. For the first time, a practical interactive interpreter is available for Pascal. People can now learn to program in a whole new way. They can look inside their program and get immediate feedback. Incorporating the Mac interface in this programming environment, THINK creates a new future for the Macintosh in education.

Writing in The New York Times, Erik Sandberg-Diment says "MacPascal alone might be reason enough for the college-bound science or engineering major to purchase" a Mac. The product becomes a standard in university computer science courses. Users are enthusiastic. But in time they demand even more from THINK.

AUGUST 1986. (Boston, Massachusetts.)—THINK introduces Lightspeed Pascal at MacWorld Expo. It is a breakthrough. It utilizes new compiling and linking technology previously available only with THINK's Lightspeed C. But it goes even further. Like Macintosh Pascal, it provides the same ability to look inside a program, but without the need for an interpreter. It offers blinding speed and the ability to build large programs. The response is overwhelming. In the first two weeks THINK sells thousands.

Lightspeed Pascal marks a turning point in programming the Mac. It has all the features that made Macintosh Pascal a standard. And much more. Now users can create real standalone "double-clickable" applications and desk accessories. THINK creates a new future for Macintosh programmers.

Lightspeed Pascal is priced at $125. It is not copy-protected. The package includes a 600-page manual with extensive index. It provides complete Toolbox/OS support. It is compatible with Macintosh Pascal and Lisa Pascal.

The future is here. Order Lightspeed Pascal now.

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Stop Waiting for Your LaserWriter

The Apple Macintosh and LaserWriter created Desktop Publishing and made high quality graphics a cost-effective reality. This also marked the advent of a new form of office bottleneck, "waiting for the LaserWriter." This means that, while printing, the Macintosh is held hostage, needlessly waiting for the LaserWriter to complete the complex calculations necessary to produce the finished page. In fact, every Mac on the network is forced to wait for a single print job.

PageMaker® Compatible

Ergotron's MacBuffer LW brings productivity to desktop publishing by eliminating needless waiting. Productivity means that every operator on the network can send MacBuffer LW their print jobs and get back to work.

MacBuffer is compatible with most of the major Macintosh software packages and the most popular desktop publishing programs such as PageMaker. It comes in 1 and 2 megabyte models and connects via Appletalk.

Stop Waiting for Your Imagewriter

If you are an Imagewriter user, MacBuffer for the Imagewriter will dramatically reduce the time the Macintosh spends waiting for the Printer. In addition to less time spent waiting, MacBuffer enables two Macs to share one printer and has a Local Copy and Single Sheet mode. Get the most out of your Imagewriter I or II with MacBuffer.

MacBuffer



MacBuffer LW; MacBuffer; and **MacTilt,** the professional workstation for the Macintosh (pictured above), are all designed to help you get more done in less time.

For more information, contact your local Apple Dealer or

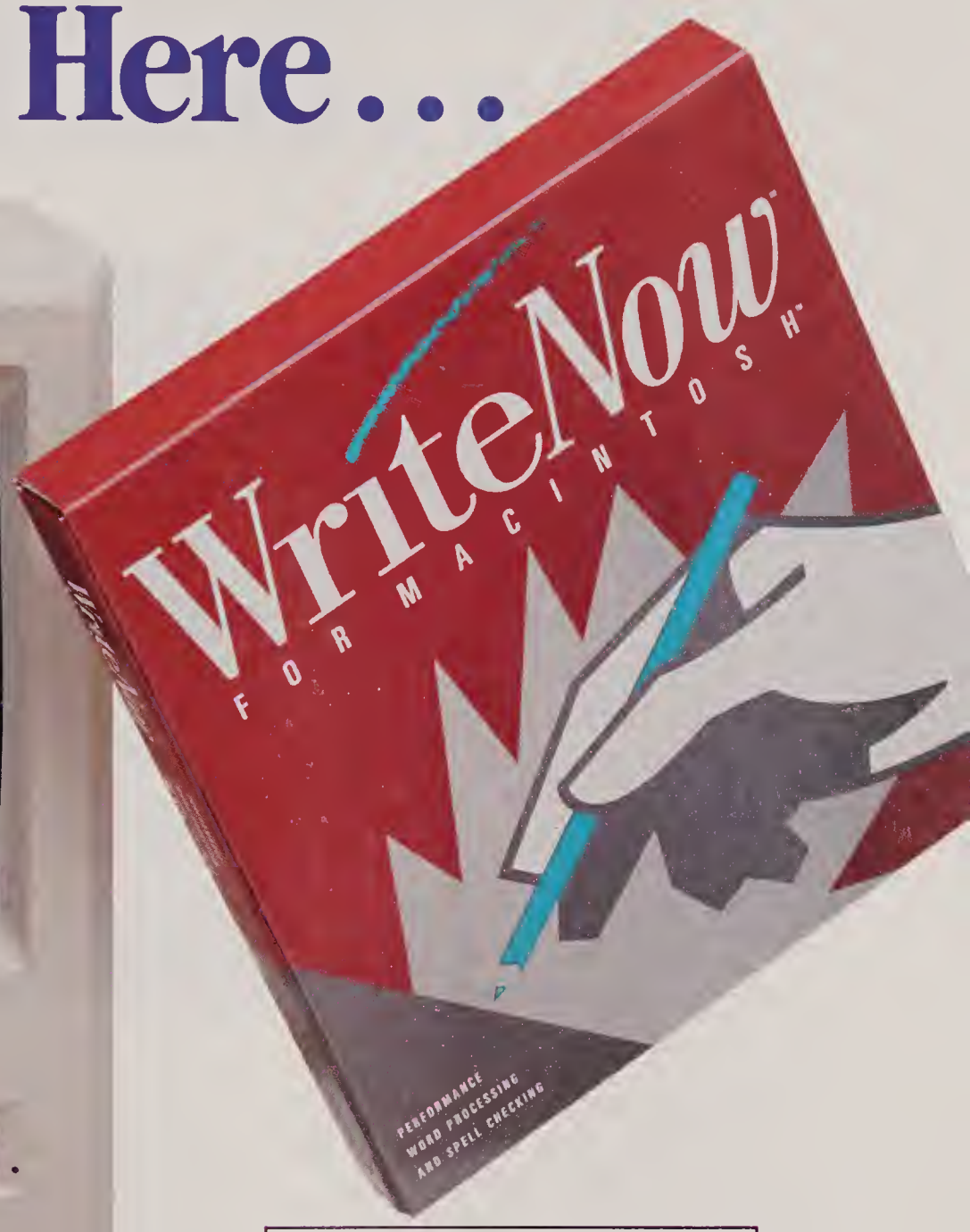
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You can do true *WYSIWYG* (What-You-See-Is-What-You-Get) editing in *one, two, three, or four columns* directly on-screen. Page breaks and characters from 4-127 points are displayed on-screen as well.

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In The Beginning... there were floppy disk drives. They were slow. Then came Winchester hard disks that plugged into a Macintosh™ serial or floppy port. These offered increased storage but were still slow.

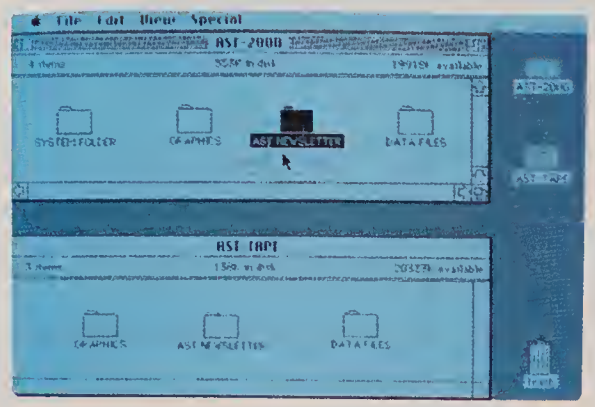
And Then One Day... someone invented SCSI (Small Computer System Interface), a much faster interface than floppy or serial ports. And suddenly, hard disks were more than just lots of storage. They were fast.

Hard disks became very popular. But a new problem arose. Disk crashes. Though infrequent, crashes were very traumatic.

Thus It Came To Be... tape backup was developed. And it was good. Data stored on a hard disk could now be "backed up" onto a tape cartridge and stored. In the eventuality of a crash, data could then be restored to the hard disk. The trauma was over.

Tape backup was slow, however, and the engineers at AST Research could not rest. They labored to create a better hard disk/tape backup system. And, thus, after many months of toil they developed a 256K Cache and a Tape Motion Optimizer Algorithm. Innovations so unique, patents were applied for.*

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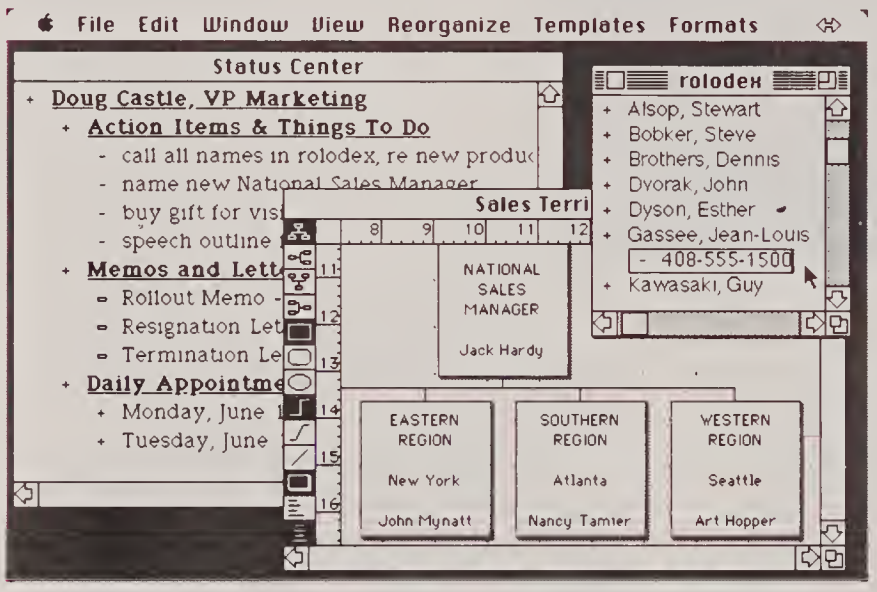


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Mac Bulletin

Solo Targets PageMaker

Target Software, publisher of *MacLightning* and *Voila,* will market MacAmerica's much-touted but unreleased new page-layout program, code-named *Solo* (formerly known as *SPUD*). Target plans to add features and put *Solo* head-to-head against Aldus's preeminent *PageMaker* program, starting with a 21-city tour to introduce the product this spring. *Solo* should reach dealers in May.

We Can Get It for You Retail

Developers desperate to get rolling on products for the expected new Mac models can't lay their hands on a prototype; there aren't nearly enough to go around. The result is a miniboom for the 68020-based Prodigy 4 upgrade made by Levco, of San Diego.

A Prodigy 4-enhanced Mac won a speed test performed at November's Comdex trade show (running an average of 40 percent faster than a Compaq Deskpro 386), which reinforces *Macworld*'s performance-test results in the August issue's "New Ways to a Faster Mac."

A Modem Gatekeeper

If you're tired of waiting in line for your department's modem, relief is on the way in the form of the modem server under development by Infosphere of Portland, Oregon, maker of *MacServe* and *LaserServe.* The modem server will allow several users to share a single modem while the program invisibly controls the stop-and-go communications traffic of connected Macs. Expected to retail for under $250 ("It has to cost less than a modem," comments Infosphere president Evan Solley), the modem server will work with any Hayes-compatible modem at speeds as high as 4800 bps (possibly up to 9600 bps) and with telecommunications programs such as *MacTerminal, Red Ryder, Microphone,* and *SmartCom II.*

The Graying of Macintosh Text

A new program from Great Britain lets you dress your colorful prose in tasteful shades of gray. MacSoft's *GreyFonts* comes in eight sets of typeface families, one for each of the LaserWriter Plus ROM fonts. Each font offers nine gradations, from 10 percent gray to 90 percent gray. *GreyFonts* works with word processing programs and other software that supports the standard laser fonts, such as *MacDraw, SuperPaint,* and *PageMaker*. And the usual style options apply, such as Bold, Italic, and Shadow. At press time there was no American distributor for the product, but MacSoft accepts mail orders with payment via Visa, American Express, or international money order. Send £49.50 per family to Macsoft, Tonedale, Wellington, Somerset, England TA21 0AA.

More Japanese Mac Options

Apple Computer has revised KanjiTalk, the operating system that converts any Mac Plus to a Japanese Mac, to allow printing on the LaserWriter. The new version was scheduled for January release in Japan. The Japanese Mac is not currently distributed in the States, but people with an urgent need for KanjiTalk outside Japan can contact Apple Software Licensing to plead for a dispensation.

Meanwhile, Qualitas Trading Company of Oakland, California, has begun distributing *JAM* (Japanese Attachment to Macintosh) software that permits data entry and output in Japanese on a Mac Plus for English-language programs such as *MacWrite, MacPaint, Multiplan, Excel, MacProject,* Finder 5.1, *Switcher* 4.4, *Microsoft File, Crunch, Filevision,* and *MacPublisher.* Qualitas now also distributes *EG7Word,* the Japanese word processing program.

A Breakthrough in Portability

Dynamac Computer Products, maker of the 18-pound Dynamac portable Mac, won unprecedented support from Apple in the form of an agreement that allows Dynamac to buy discounted Macs directly from Apple to rework into laptop facsimiles. Until the November agreement, Dynamac –along with Colby Systems and Intelitec, the other makers of Mac portables–was left on its own to find Macs to cannibalize for parts. Similar agreements with the other two suppliers may follow, but Apple doesn't plan to sell Mac parts to outside developers. Apple's policy may be designed to keep its own portability options open.

Another Word Processor

Ann Arbor Softworks, publisher of *FullPaint,* last month introduced its entry into the suddenly crowded Mac word processor field. Called *FullWrite Professional,* the program (about $300) seems to be aimed at the high end of the near-desktop-publishing market; it offers features such as multiple columns and the ability to automatically wrap text around irregularly shaped graphics. Users can paste in bitmapped graphics from programs such as *MacPaint* or create object-oriented *MacDraw*-like images in the program's built-in drawing module.

IBM PC AppleTalk

Eicon Technology of Montreal, Canada, has announced communications cards and software that connect IBM PCs and compatibles via EicoNet, an AppleTalk-based local area network. This system gives EicoNet users access to an X.25 packet-switched network such as Telenet or Tymnet. The Serial Communication Adapter (SCA) imple-

(continues)

ments the lower layers of the AppleTalk protocol and lets you connect each PC on the network with standard AppleTalk or Farallon Computing's PhoneNet cable. Installing Eicon's Network Adapter card into one PC, dubbed the communications server, gives all networked PCs access to the X.25 gateway. Network users communicate over the X.25 network with remote PC networks; stand-alone PCs using Attach/X.25 software; or remote hosts using Access/X.25, Access/QLLC, or Access/SDLC software. While Eicon's products are now available only for PCs, an Eicon representative stated that the company is talking with Macintosh developers about making the product Mac-compatible.

Sidekick with a Twist

▶ Borland International has picked up *ClickOn Worksheet,* the desk accessory spreadsheet dropped by T/Maker. Borland plans to revise and package it as part of a new version of the *Sidekick* collection of desk accessories.

Music Makers

▶ Last month *ConcertWare,* one of the first music products for the Mac, appeared in a new version that supports PostScript and Adobe's music laser font. That makes the composing and MIDI controller program from Great Wave the latest in a flock of desktop music-publishing tools that emerged not long after the LaserWriter.

Generic CAD Comes to the Mac

▶ The IBM PC's best-selling CAD program is migrating into Mac territory. Generic Software of Redmond, Washington, is converting its entry-level *First CAD* package for the Macintosh. The two-dimensional drafting and design program will cost about $50; Generic expects to release the program this month.

Roll 'Em

▶ Beck-Tech of Berkeley, California, recently released *MacMovies,* a program that creates frame-by-frame, or *cell,* animation. The program compresses and combines a series of *MacPaint* documents into a "movie," which you can play forward or backward at a variety of speeds, stop at any frame, or chain to other movies for a longer presentation. Although you must save frames as *MacPaint* files, images may originate in programs such as *FullPaint, SuperPaint,* or *Easy3D.* Graphics can also be captured, one frame at a time, from a VCR or optical disk player via a video digitizer. *MacMovies* can be used to produce animated business presentations, storyboards, or art for art's sake.

Scanner Update

▶ Whether you consider it a vote for the Macintosh market or an example of the constructive exchange of ideas between technologies, the Mac seems to be attracting a number of input scanners originally designed as peripherals for the IBM PC.

At last fall's Comdex, companies such as AST Research, Datacopy, DEST, and Microtek showed Mac versions of devices that turn printed words into on-screen pixels. Furthermore, the models from Datacopy and DEST—and one from Abaton that was designed as a Mac device—also turn printed words into text or *MacWrite* documents. On the other hand, the PC is also learning from the Mac. Both Epson and Houston Instrument presented ThunderScan-like scanning heads for printers and plotters.

In a departure from other scanner announcements, LoDown will introduce a 300-dots-per-inch (dpi) sheet-fed scanner that employs a unique gray-scale system of translating images to pixels: each dot is assigned to one of 32 levels of gray. Adding gray-scale information to a 300-dpi scanned image produces better results: when printed on a 1200-dpi Mergenthaler typesetter, the scanned image is as clear as any traditional halftone.

The LoDown scanner attaches to the Mac Plus SCSI port and is priced at $1200 or $2200 when bundled with the LoDown 20-megabyte hard disk. That compares favorably with Abaton and Microtek scanners in the $2500 range.

Myth Made to Order

▶ It's not just the mystique of a cryptic name that makes *Red Ryder* a legend among Mac enthusiasts and hard-core telecommunicators; continual updates and esoteric features account for a lot of the program's loyal following. Still, the name, which developer Scott Watson said was explained by secrets embedded in the program, added a certain romance. At least it did until November's Mac fair sponsored by the New York Mac User's Group. There, Watson finally relented and revealed the secret of the *Red Ryder* name: his late partner Buck Buchanan suggested giving their shareware program a name that *sounded* as if it meant something but didn't. The program's namesake? A singer in a midwestern strip joint. A Mac user perhaps?

New Compiler for MBASIC

▶ Microsoft has given its BASIC interpreter a new lease on life with the recent release of its companion compiler. *The Microsoft BASIC Compiler* allows users to compile MBASIC programs with little or no modification, resulting in much speedier execution times—10 to 30 times faster. A Toolbox Library, licensed from Clear Lake Research, accompanies the compiler and carries a list price of $195.

More PostScript Printers

▶ Comdex ushered in three new products that support Adobe Systems' PostScript page-description language. The Diconix Dijit 1/PS ink-jet device prints 20 pages per minute at 300-dots-per-inch resolution—and it's the first PostScript printer that automatically handles printing on both sides of the page. ITT Qume will release its 300-dpi Qume ScripTEN ($5695), a 10-page-per-minute printer, in May. And NEC Information Systems announced the 300-dpi SilentWriter LC-890 ($4495), which features 35 resident fonts. □

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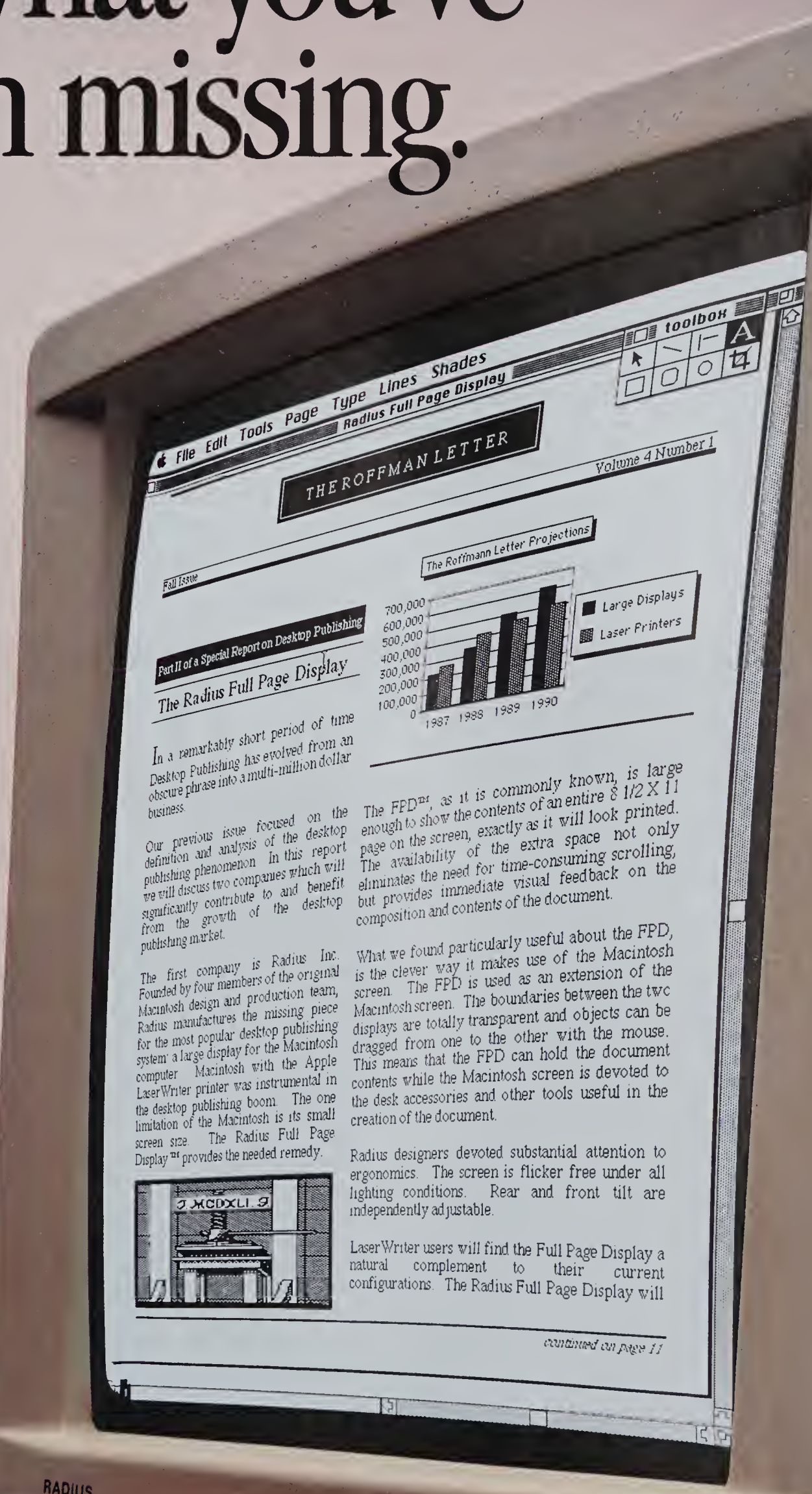
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Power–The block format of Trapeze lets you set up worksheets quickly. Even complex models can be created easily, because Trapeze contains over 100 functions and formulas, many of which are unavailable in other spreadsheets. You can create charts which plot thousands of points, and multiple databases allow you to efficiently organize your data for presentation. Trapeze takes full advantage of the power of the Macintosh; in fact, the size of your model is limited only by available memory.

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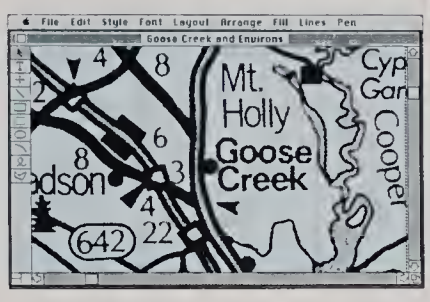
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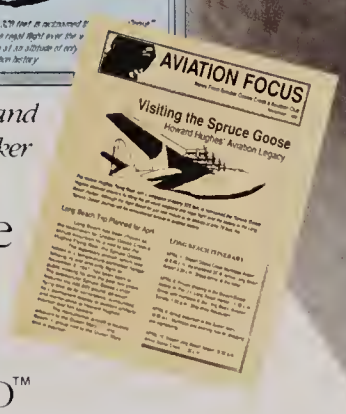
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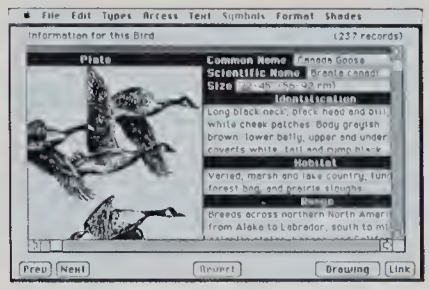




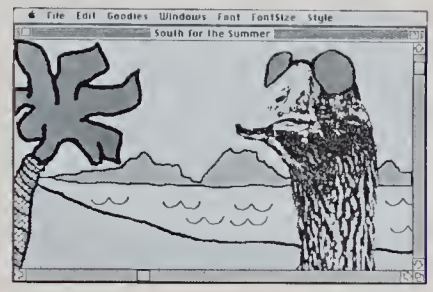
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A 60,000-word spelling checker proofs your stream-of-consciousness prose quickly – giving you more time to be creative.

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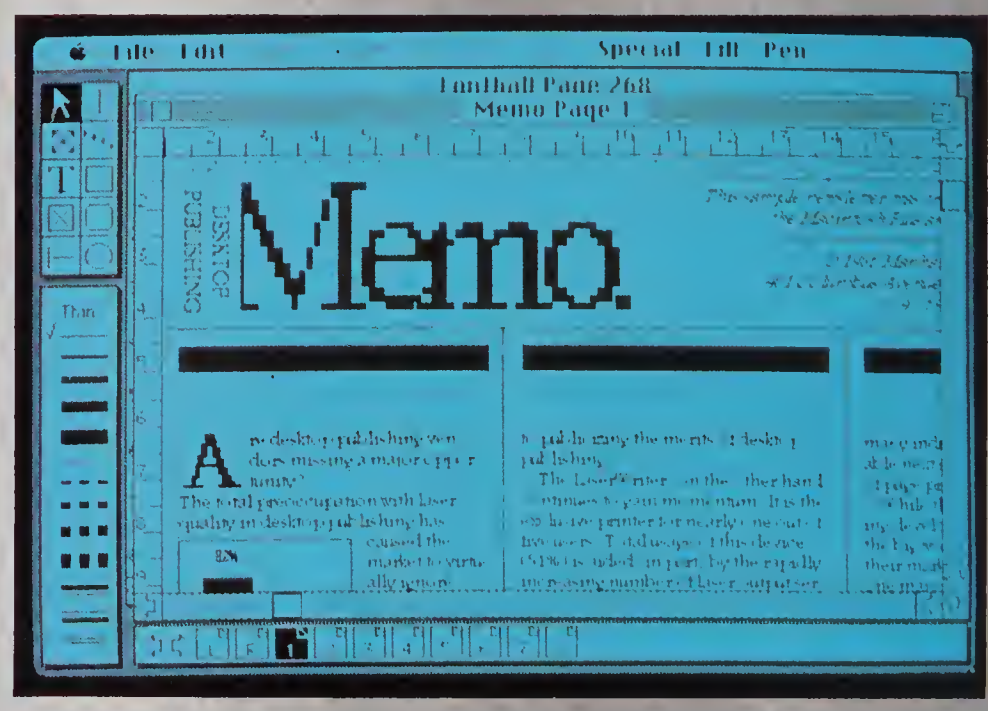
Just finished a great novel in Microsoft® Word or MacWrite™? No problem, import these files as formatted.

Ready,Set,Go! gives you the runaround.

When you're ready to add graphics, Get Picture retrieves your MacDraw,™ MacDraft,™ MacPaint,™ FullPaint™ – or other compatible art – quickly.

Now drop a picture block on any text area. Spontaneously, the text reconfigures itself to snake around your graphic – an incredible timesaver.

Use this technique to wrap text around large capitals or graphics created with built-in drawing tools.



Windows with a view.

Open several windows to combine cut-and-pasted elements from many different documents.

You'll be the Dali of desktop publishing, splashing text and graphics throughout several works at once. Not just productive – but prolific, too.

And you won't mind doing windows using Ready,Set,Go!'s five fascinating views – which include full-page editing.



Remarkable design features.

Ready,Set,Go! also kerns, letterspaces or shifts text up or down with a single keystroke. Not sold yet? How about direct PostScript™ programming for stunning effects? And an unlimited page capacity with automatic page numbering, time-and-date stamping and left/right master pages?

We're sure that no other program even approaches Ready,Set,Go! in design power, text entry flexibility, ease of use, execution speed or price: only $295. While words cannot adequately describe this revolutionary program, our video demo can. For $15 we'll send you an informative videotape to demonstrate Ready,Set,Go!'s versatility. To order Ready,Set,Go! or the videotape call us at **800-634-3463** (in New York call 914-769-2800). Or visit your nearest dealer.

Manhattan Graphics.

401 Columbus Avenue, Valhalla, NY 10595

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Circle 2 on reader service card

David Bunnell

The PC Revolution in Higher Education



Hey, Big Mac on Campus! Now you can access Future 101 and earn a degree in lifelong learning.

Recently I caught a plane to Pittsburgh, Pennsylvania, where I attended what I thought was the most stimulating computing event of the past ten years.

It was the Educom '86 conference. Educom, the national educators' consortium of nearly five hundred universities and colleges, is committed to furthering higher education through computing. The theme of this particular conference was "At the Point–Where Education, Research, and Technology Converge."

Everyone present at this point of convergence in Pittsburgh could feel the powerful future of computing. There among the city's extinguished steel mills–relics of the first industrial revolution, laced with a fine layer of snow–in a meeting cohosted by the technical powers of Carnegie-Mellon University and the University of Pittsburgh, I had a good glimpse of where this second industrial revolution (our own information age) is leading us.

The smokestacks have been replaced by advanced workstations, the blast furnaces by expert systems, and the molten steel by an outpouring of high-grade knowledge. The vision is astonishing.

I discovered incredible innovation, enthusiasm, and potential applications for personal computers and workstations at this conference of 1600 scholars. I was astonished to see that Apple Computer had sent a delegation of 100 people to attend Educom. IBM easily matched that number.

Other computer companies represented at the conference–only a small handful, really–included AT&T, Microsoft, Hughes Aircraft, Digital Equipment, and Steve Jobs's NeXT, Inc., which must have had nearly 100 percent of its small, dynamic staff in attendance.

All these companies are working on programs for the burgeoning field of higher education. We have no reliable projections of just how big this area will become. However, I came away from Educom with one very strong impression. It seems to me that while the business world's message to the computer industry is, "Don't be innovative with hardware; stick to the standards," the educational community is clamoring, "Push the technology as far as you can!"

Not only does the hunger for high technology resemble the feeding frenzy of a school of piranha, but educators want tomorrow's technology at cafeteria prices.

As Steve Jobs remarked in his keynote speech at Educom, "Since 1984 [when the Macintosh was introduced] your needs have grown, and it seems you want a lot more. You want a 10MB machine, and I guess it should come as no surprise that you still think you should have it for $3000."

The higher education market is certainly an anomaly. It's the only group of computer users I've found that writes most



At the Educom conference in Pittsburgh, the call was to take the technology to its limits.

of its own software. To show they mean business, these technoacademics have launched their own incentive program, called Educom Software Initiative, to encourage software development by faculty and students.

This program includes the awarding of cash prizes, proposed credit toward ten-

(continues)

DRIVEN BY



MagNet 20X and 30X

The MagNet 20X was one of the first 20 meg SCSI drives available for the Mac Plus, and has proven to be one of the most reliable and popular drives sold. The 20X is reliable because it was designed to run cooler, as much as 30% cooler than drives without a fan. Heat burns the delicate components of your drive and the hotter the drive the shorter the life. The 20X is fast because of our efficient software and clean design. Nibble Mac magazine found out of nine contenders the 20X to be the fastest drive tested. Quality is tested for at every stage of manufacturing and our technicians personally sign off at each step onto a Quality and Assurance report that is included with every Mirror drive.

The MagNet 30X is the perfect choice for the users who feel their storage needs will grow. Priced at $1195.00 the MagNet 30X gives you 50% more storage than our competitors' higher priced 20 meg drives. Both the 20X and the 30X come with backup utilities and optional MacServe networking software (a $250.00 value).

The Tape Drive The Library Of Congress Chose

The Magnum Tape 20 was the tape drive chosen by the Library of Congress and two of the world's largest accounting firms, Arthur Andersen and Peat Marwick, to back up their Macintosh computers. These groups understand the importance of data integrity and quality: they chose the Magnum Tape 20.

The Magnum Tape 20 was the first tape drive introduced for the Macintosh and since the introduction a good product has only gotten better. Our free software update policy has allowed our users to improve their Tape 20 with features like multiple volume, file by file and incremental (last changes made) backup capabilities. The Tape 20 runs silent and cool to give you the worry-free performance you need.



Magnum Tape 20

Great Warranty, Stellar Service.

Mirror Technologies has always striven to be the leader in the Macintosh storage market. In January of 1986 we were the first in the business to introduce a one year warranty. Customer service is a high priority and ours has gained a reputation for being second to none. We consistently get letters from people like W. D. Ball of Syracuse, NY, who wrote "The main reason I will continue to seek and purchase Mirror Technologies products is because of your service technicians and the quality of service and support I have received." It's satisfied customers like this that have given our customer service department its quality reputation.

The Original 800K Drive

Mirror Technologies was the first company to introduce an 800k drive for the Macintosh. (We even beat Apple.) Since then we have satisfied thousands of customers with the speed and value of the best built drive on the market. MacWorld magazine said the Magnum 800 "comes with several features the Apple drive lacks." Features like a one year warranty, and a push button manual eject in addition to the auto eject. The Magnum 800 is compatible with the Mac 128, 512, and Plus. Reading and writing 400k or 800k diskettes. Quiet, fast and priced far less than the Apple drive, the Magnum 800 is the perfect value for your Macintosh system.



Magnum 800

QUALITY



MagNet 40/40

Power, Performance And Security

The MagNet 40/40 hard drive with tape backup offers speed, dependability, multiuser software, plus peace of mind. Perfect for big applications like desktop publishing. CAD, CAM and financial modeling where large storage and data integrity are crucial. The MagNet 40/40 connects directly to your Mac Plus via the SCSI port or to your Mac 512k by adding our fastport. The 40/40 allows you to backup by volume, by individual file, or incrementally (last changes made). With the incremental capability you can backup most daily work in under four minutes. Every 40/40 includes MacServe™ networking software from InfoSphere to give you Multiuser, Multitasking and a host of other features. The MagNet 40/40 is the drive of choice for companies like GTE, Apple and Blyth Software (the developers of the powerful OMNIS database). These are just a few examples of users with large storage needs and crucial data.

Drive Forever



MagNet 85X and 172X

The MagNet 85X and 172X hard drives combine blistering speed and enormous capacity with tape backup and multiuser/multitasking software. Now an entire office of Macs can share data and peripherals for maximum performance and efficiency. Using voice coil technology these high capacity drives are three times faster than standard hard drives. The 3M 40 meg tape backup in the MagNet 85X and 172X give you peace of mind knowing your data is secure. The MagNet 85X and 172X are compact, quiet, and powerful alternatives to the AST 4000. The 172X has two times the drive capacity for the same price as the 4000 drive.* Coupled with our standard one year warranty and toll-free support, our "super drives" will satisfy your hunger for power no matter how big the appetite.

Good Companies Run With Mirror

We ship more Macintosh drives than anyone in the industry. (Except of course for our friends at Apple.) Because of this, Mirror Technologies has thousands of satisfied customers worldwide. Our corporate customers read like a roll call of the Fortune 2000. Companies like Honeywell, AT&T, 3M, RCA, Apple, GTE, Kodak, Motorola, and DuPont. We also include amongst our fans the nation's top research labs, places like Bell Labs, Cray Research (the developers of the world's most powerful supercomputers), Lawrence Livermore Labs, Rockwell Shuttle, NASA, and Control Data. Practically every major university in the United States uses Mirror drives, institutions like Harvard, MIT, Princeton, Cal Tech, Stanford, Duke, Dartmouth, Columbia, Cornell, and Yale.

Mirror Technologies drives also run on thousands of Macs for companies, and persons with aspirations to be great, companies like Don's Dog Service, Anderson's Nursery, Ads Up Inc. and even Australian Himalayan Expeditions Inc. Small companies with an eye to getting big. Why do we have so many satisfied customers? We believe that it is because of the commitment to quality and service that is included with every Mirror drive shipped.



MIRROR TECHNOLOGIES Inc.

2209 Phelps Road, Hugo, Minnesota 55038
612-426-3276

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*Based on November 1986 suggested retail pricing.

ure for professors who develop "courseware," general academic recognition—and, of course, royalties on courseware sales.

Then there's the incredible seventy-million-dollar Project Athena at MIT, funded by IBM and DEC, in which scholars are working to fuse film and computing into a new medium for making super-simulations.

For example, for a biology course at MIT, scholars have created software that simulates an electron microscope. The computer appears to zoom in on (or away from) an image; what it actually does is access from the database a series of pictures that are progressively smaller or larger, instead of enlarging or reducing the image.

MIT is also working on a telescope simulation that lets you explore the heavens star-by-star and galaxy-by-galaxy. There's also a submarine simulation that plunges you 20,000 feet beneath the Atlantic through a series of 50,000 pictures.

Another important area of ongoing research is the Athena Language Project, which combines computers with video for studying foreign languages. Researchers are testing various methods to see what works best.



There was great enthusiasm for developing innovative applications at this conference of 1600 scholars.

The Spanish-language program is an interactive mystery story set in Bogotá, Colombia. It's a whodunit that lets you take part in the action—in Spanish.

The French program, on the other hand, is reminiscent of the well-publicized Project Aspen interactive videodisk, in which you get to know every nook and cranny of Aspen, Colorado. The French program gives you a series of realistic situations for practicing French. You go into a shop, ask prices, buy things—or, if you prefer, you can play a passive role and just window-shop, observing others going through the business of shopping in France.

What gives this program extraordinary implications for higher education is its potential connection to a much bigger, all-purpose knowledge base, accessed through a campus network.

Voilà. You're in French 101 or Advanced French, whichever the case may be, and you're strolling along the banks of the Seine. You cross over to visit Notre-Dame, perhaps chat with the local street vendors,

(continues)



Coral Software introduces
Object Logo

A programming language like none before it.

Object Logo is a new programming language developed specifically for the Macintosh. Object Logo incorporates the symbolic processing power of LISP, full object-oriented programming capabilities and the most advanced math package ever put on a microcomputer in a proven, easy to learn educational programming environment. Object Logo — it's a rare blend of simplicity and sophistication.

The Object Logo programming environment features an editor with multiple windows, a debugger, and a hidden native-code compiler, so you get the advantages of both a compiler and an interpreter, rolled into one. Object Logo also improves on the graphics capabilities that made Logo famous with multiple graphics windows and multiple turtles, each implemented as customizable Object Logo objects, and with access to more than 100 Quickdraw commands. Sounds overwhelming? The Object Logo manual is written by experienced educators whose examples and comments will guide you every step of the way.

"High-level" programming with objects puts the full power of the Macintosh at your command. Yet with Object Logo, it's easy. Object Logo is already being used by the Apple Vivarium Project, by faculty and graduate students at MIT, and by prestigious Artificial Intelligence Labs such as Bolt Beranek and Newman, Inc. With Object Logo, you can still teach your students geometry, but you (and they) can also explore the most advanced concepts in computer science — like artificial intelligence and object-oriented programming — with ease!

Coral SOFTWARE

CODs and purchase orders WILL NOT be accepted by Coral Software. Price is suggested retail price and is subject to change without notice. Minimum system requirements for Object Logo: 512K Macintosh 800K disk drive or any external disk drive. Object Logo is a trademark of Coral Software Corp. Macintosh is a trademark licensed to Apple Computer, Inc.

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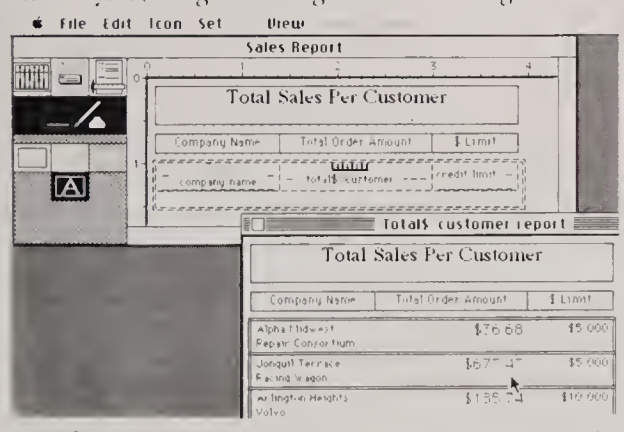
THE ONLY COMPLETE MULTIUSER SYSTEM FOR APPLETALK AND ANY HARD DISK

MultiUser Helix

MultiUser Helix is a shared data-based information management and decision support system that includes a complete application building environment. With MultiUser Helix you can design a system to run a business, office, or department and then share that system to coordinate the efforts of your people.

No programming necessary

Use icons and visual design tools to create all the vital input and report forms, lists, analyses, and mail merge letters needed to run your business. No need to learn a programming language, understand arcane command codes or special formulae. Visual building blocks let you quickly set up data-based calculations to take care of any business need; from order entry, inventory control and invoicing to sales analyses, budget tracking and asset management.



Design forms that reflect the way your business works — from mailing labels to entry forms to presentation-quality reports. All Macintosh fonts, styles and graphics capabilities are supported.

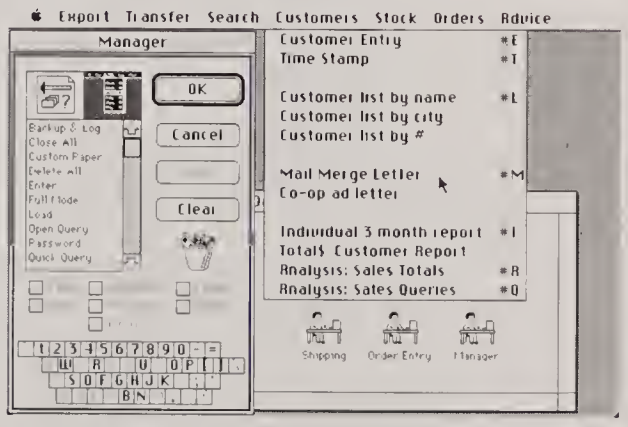
Everything built in

In MultiUser Helix, the multiuser capability — enabling more than one person to work with the same information base at the same time — is built into the software. All other systems require special hardware or extra software. They "force" a multiuser effect with programming tricks like "semaphores," and rely on external "fileservers" to simulate multiple access to files. This results in a complicated, inflexible, slower, and more expensive system. In MultiUser Helix, the whole network functions like a human nervous system, with its own updating and feedback mechanisms as a natural part of the system. There is no reliance on external hardware devices, and no need to worry about programming interlocks and special volume configurations.



A system everyone can share

Just connect your Macintosh computers with the AppleTalk network (the same cables that connect the Macintosh with the LaserWriter). MultiUser Helix automatically updates all screens and shows the current results of any changes made on the network. MultiUser Helix handles all network control, including record updating and record locking. Since everything is already built in, there is no need to worry about special fileserver hardware or software. Best of all, MultiUser Helix works with any hard disk.



Simply type your own menu names into the Macintosh menu bar and drag form names and commands into the menus. Then click user options and permissions on a per form basis before assigning keyboard controls which instantly open forms for entry, automatic reports and printing.

Expandable

This package contains 3 MultiUser Host/Guest disks, so that you can start with a 3 station network. Additional stations are available to a total of 31 per network.

Full support from Odesta

This MultiUser Helix package includes: 7 disks (2 Double Helix v.1+ program disks, System disk, Resource/Work disk with sample applications, 3 MultiUser Helix Host/Guest disks); 3 reference manuals, including a tutorial Quick Start guide, and an 18 ring project binder with notepad. To Odesta, your business is as important as our own: call us toll-free with technical questions or to inquire about our Consulting and Application Design Services.

Key Network Features

- Supports AppleTalk Network
- Compatible with any hard disk **(no fileserver required)**
- Expands up to 30 users per network
- Each user can have his or her own personalized menus and password that relates to that person's function
- Time stamping
- Automatic external data log file to ensure data integrity
- Automatic updating of any record or list — on screen
- Complete control of viewing, adding, deleting, changing, or printing information on a per form/per user basis
- Capability of having multiple "hosts" on one network simultaneously
- Can be used in conjunction with volume servers and file servers
- MultiUser Helix receives the same excellent support Odesta gives to the other members of the Helix family

Requirements

- Network host requires hard disk, and 1Mb memory is recommended.
- AppleTalk Network.
- Guest nodes work with the Macintosh Plus, 512E, or Macintosh 512 with external drive.

Odesta Corporation 4084 Commercial Avenue Northbrook, IL 60062 U.S.A.
800-323-5423 (In IL) 312-498-5615

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MindWrite™ The Po
With Integra

Now there's MindWrite, the new standard in Macintosh word processing that liberates you to write the way you think.

Works The Way You Do

MindWrite is a powerful word processor with totally integrated outlining that lets you write the way you think. Because now you can outline while you write. Write while you outline. Jump back and forth between topics and text, move easily around your document, put ideas on hold, change your mind, or advance to new thoughts without losing your concentration. Or your patience.

Organizes Creativity

MindWrite makes it easier to organize your thoughts on paper. You can now spend more time being creative and less time word processing. Arrange and rearrange text intuitively without awkward organizational problems. You'll see your work flow smoothly from concept to final document.

Gives You Total Control

What you see is what you get (WYSIWYG) through MindWrite's powerful, flexible and easy-to-use integrated operation. Display multiple views of the

Word processing and outlining features are totally integrated and always available — in every window, in every document.

MindWrite's multi-level rulers (one shown) make it easier to create complex documents.

Pick up and move text with the hand cursor — easier than cut and paste. And renumbering is automatic.

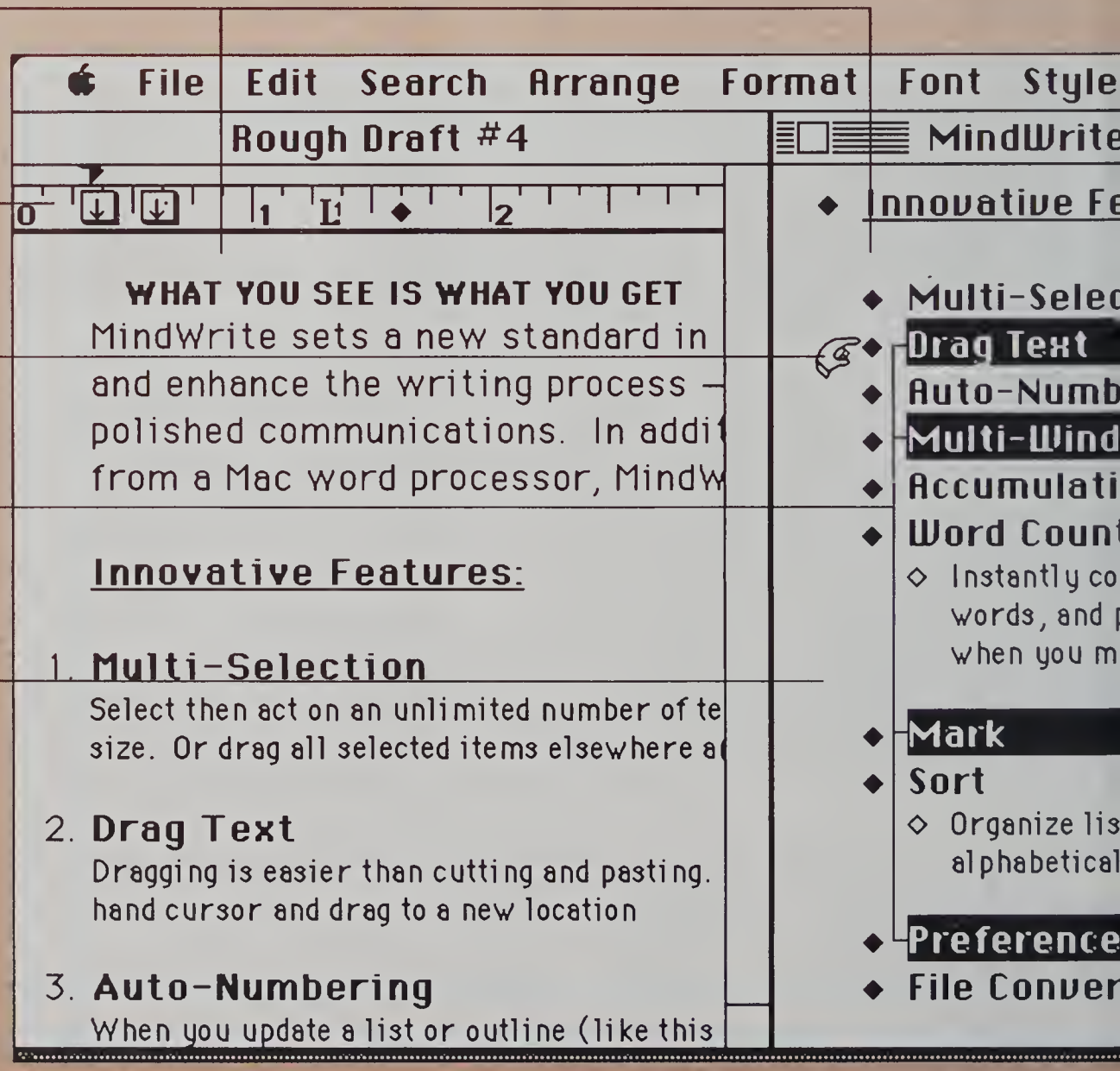
Multi-Selection lets you act on many headings and/or paragraphs simultaneously. Change font or style, move, copy, etc.

Collapse or expand outlines to any level of detail. To reorder, drag with hand cursor. Renumbering is automatic — on screen and in print.

Reads/writes MacWrite files and reads Think Tank files.

Click zoom buttons to resize windows instantly. Convenient "Windows" menu activates hidden windows.

Display a collapsed outline in one window with detail expanded in another.



30-Day Money Back Guarantee. If within 30 days of purchase you find that this product does not perform in accordance with our claims, call our customer service department and we will gladly arrange a refund.

MindWrite works with Mac 512K, Mac Plus, ImageWriter I & II, LaserWriter & LaserWriter Plus.

Circle 518 on reader service card

ver Word Processor
ed Outlining.

same document, automatically number headings, collapse and expand text, sort lists, import graphics, change fonts and style, and rearrange text easier than ever before.

You'll find that MindWrite far surpasses other word processors in helping you to not only better organize your written communications, but do it in less time as well. And if you already know MacWrite, you can start using MindWrite right away.

Retail Price $125.

MindWrite

New Standard In Word Processing

MindWork Software
P.O. Box 222280
Carmel, CA 93922 (408) 625-2720

What You See Is What You Get

MindWrite sets a new standard in word processing. It's designed to facilitate and enhance the writing process — to help you creatively organize ideas into polished communications. MindWrite can save you time and help you write more effectively — whether you're dashing off a memo or letter, creating an ad campaign, or laboring over a book or detailed technical specifications. Organize your rough ideas into polished prose with MindWrite — you no longer need to buy one expensive software program for word processing and another for outlining.

In addition to the standard features you expect from a Mac word processor, MindWrite offers many innovations. Here are just a few:

1. Multi-Selection
Select then act on an unlimited number of text segments, adjacent or not. C… style, or point size. Or drag all selected items elsewhere and see them instantly reord… you chose them.

2. Drag Text
Dragging is easier than cutting and pasting. Pick up any number of headi… the hand cursor and drag to a new location.

3. Auto-Numbering
When you update a list or outline (like this one), or even rearrange entire se… document, MindWrite instantly renumbers for you — on screen and …

4. Multi-Windows
The number of document windows you can dis… memory. Convenient window management too… working with many windows easy.

5. Accumulating Clipboard
All your cut and copied text is accumulated in the … extensive Undo feature to protect you from most mis…

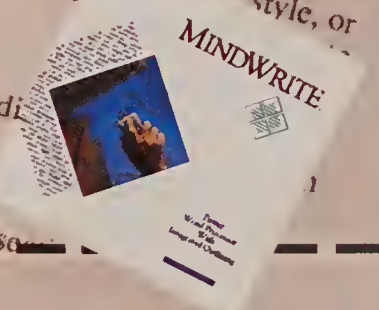
6. Word Count
Instantly counts characters, words, and paragraphs. In…

7. Mark
Identifies paragraphs that have been revised within a … easily find and review recent changes to your document.

8. Sort
Organize lists or outlines alphabetically.

9. Preference
Customize MindWrite to fit your personal needs with preference sets you create and save. S… default font and size for new documents, enable/disable Quick key shortcuts, … autonumbering, show/hide rulers and pagination, choose search options, … or ruler.

10. File Conversion
No need to start over. MindWrite wil… can save MindWrite files to … as PageMaker™



Order Today

Please send _____ copies of MindWrite at $125 each. Include $3 handling/shipping for each copy (in the continental U.S.). Calif. residents please add 6% sales tax.

To order today, use this coupon or call our Toll Free number: **800/367-4334** and, California only **800/654-5599** with your credit card number.

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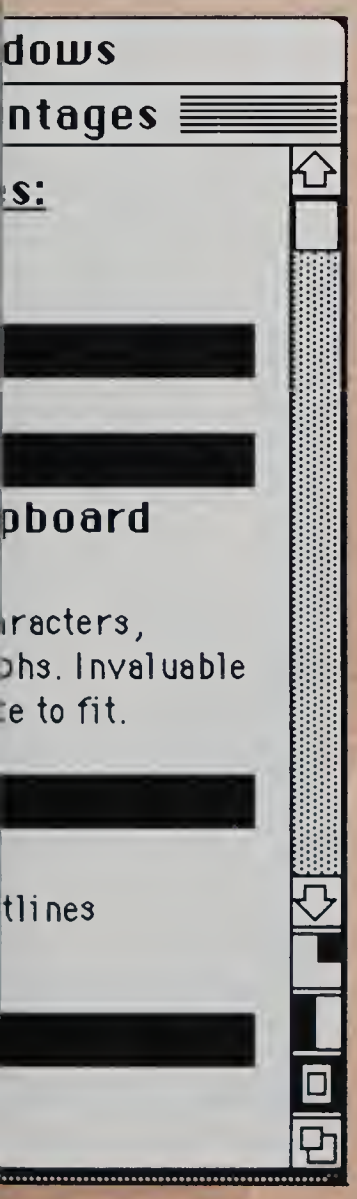
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Dealer Inquiries Invited. Call For Details.



and start studying the architecture. Then something interesting happens: you switch the computer to an architectural database and find out about the structure of the cathedral.

The goal is to have all courses access the same central database. While in Pittsburgh I visited Carnegie-Mellon, and there I felt another jolt of enlightenment when I was introduced to Project Andrew. The university is building a campus network that will connect 10,000 personal computers and 300 advanced workstations. All the wiring has already been done. Every classroom, every dorm room, and every computer station on campus is now connected. Currently, about 1400 personal computers are hooked into the system, and some 3100 students and faculty members are on line, sending electronic mail and accessing various databases and bulletin boards. The implication of Project Andrew, as CMU president Richard Cyert points out, is that it will open the door to lifelong learning.

For the first time in the history of education, the university will be able to broadly extend education to graduates. Alumni in mid-career will be able to take various refresher courses simply by accessing Project Andrew from their offices and homes around the country.

As an event, Educom '86 was truly a milestone. It proved once again that innovation is not dead. It was proof, too, that people can gather together and put pressure on the computer industry—and be heard. It was empirical evidence, by anyone's lab criteria, that new roles for the computer outside the business world will emerge in the future.

Furthermore, it's clear that software being developed in universities will be used in the business world as well. In the next few years, the university setting will become the new battleground where companies like IBM, Apple, DEC, and NeXT will be competing mightily to provide the best advanced 10MB workstation for the campus of the future.

Of paramount significance to computer companies is the fact that Educom's Software Initiative has set a firm policy on software copying, observance of copyrights, and respect for intellectual property. A number of programs have been introduced to educate faculty and students about these issues. Universities have been urged to place sanctions against violators of the Educom code.

A recent Educom survey shows that about 75 percent of universities in the country now have programs to discourage software piracy.

This ought to remove any paranoid bugaboo software publishers might have about shipping their products into some "black hole" on campus.

Perhaps the biggest revelation I had at Educom was that the focus of truly creative computing and applications has shifted from corporate America to the universities.

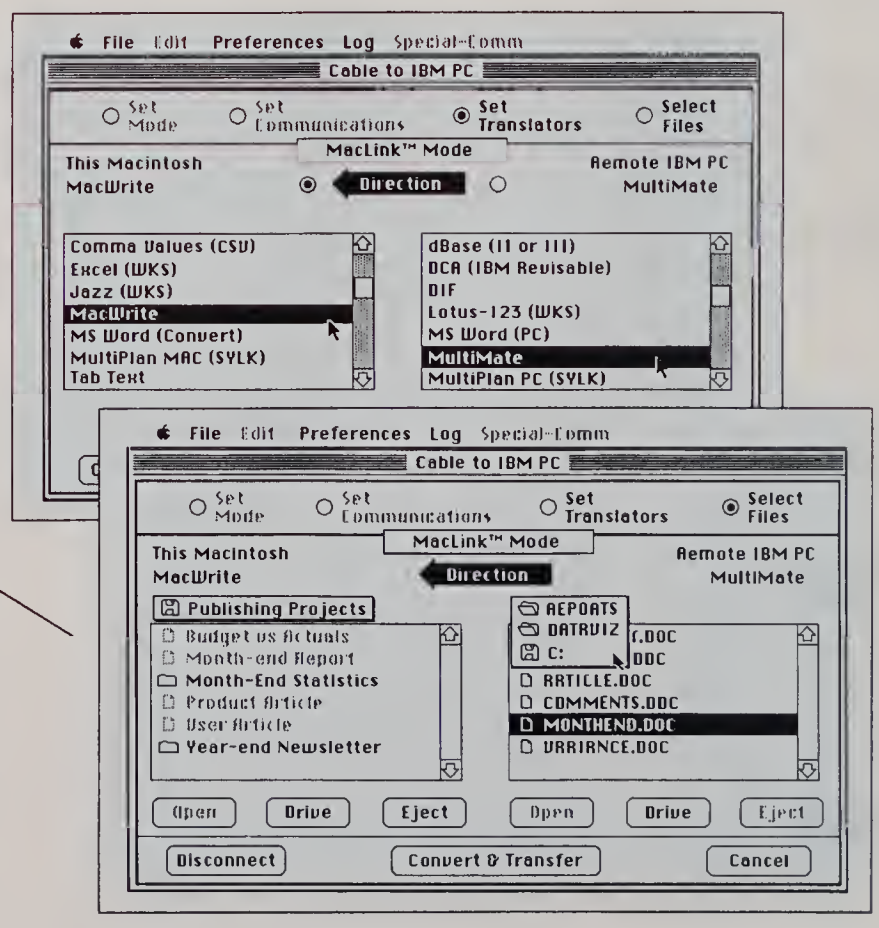
Make no mistake about it, this is a major shift. In American universities intelligent people are taking the tools of computing and pushing them to their limits. They are *enhancing* computing. Meanwhile, in corporate America the opposite is often the case. People take sophisticated tools and use them to perform mundane tasks.

So it was encouraging for me to see that innovation is not dead. And it's not playing hooky either. It's alive and well—and has moved from the Fortune 1000 to the hallowed halls of the campus.

I'll see you in class. □

MacLink*Plus*™ ... Connectivity to the IBM PC *plus* ...

- Its a complete "kit" for exchanging files between the Macintosh and the IBM PC (and compatibles)
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- TTY terminal emulator for general communications
- $195 includes Macintosh software, PC software, built-in translators, manual and cable
- Wang and NBI options available



DataViz Inc.

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Ten thousand pages, take it or leave it.



For those of you going places, here's a little something that solves big storage problems in the time it takes to say who has the Farnsworth financial files.

Introducing Totem.™

A rather revolutionary Bering 20 mb Bernoulli compact disk drive system for Macintosh computers. And, the first truly *portable* 5¼" system. One that lets you tote around 10,000 pages of data on a sleek cartridge about the size of a piece of bread.

Translated, that's 25 times the storage you get on one standard floppy.

Yet unlike floppies, the Totem is no slouch for speed. It's just as fast as a hard disk. In fact, your computer will think it's a hard disk. You can even share it with co-workers. And its advanced Bernoulli aerodynamics make it resist head crashing. If you've ever used hard disks, you know what a pain that can be.

But the real beauty of Totem is that it fits perfectly right under your Mac. No mess. No fuss. And no extra hardware to buy. To add storage, just pick up another Totem cartridge.

Last, but certainly not least, there's a whole family of Totem drives to choose from. They're all in the brochure. To get yours, write or call Bering Industries, Inc., 240 Technology Circle, Scotts Valley, CA 95066. Inside California, call 800 533-DISK. Call 800 BERING 1 outside California. Just say "I'll take it."



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PC Magazine has selected TOPS as the "Best of '86"

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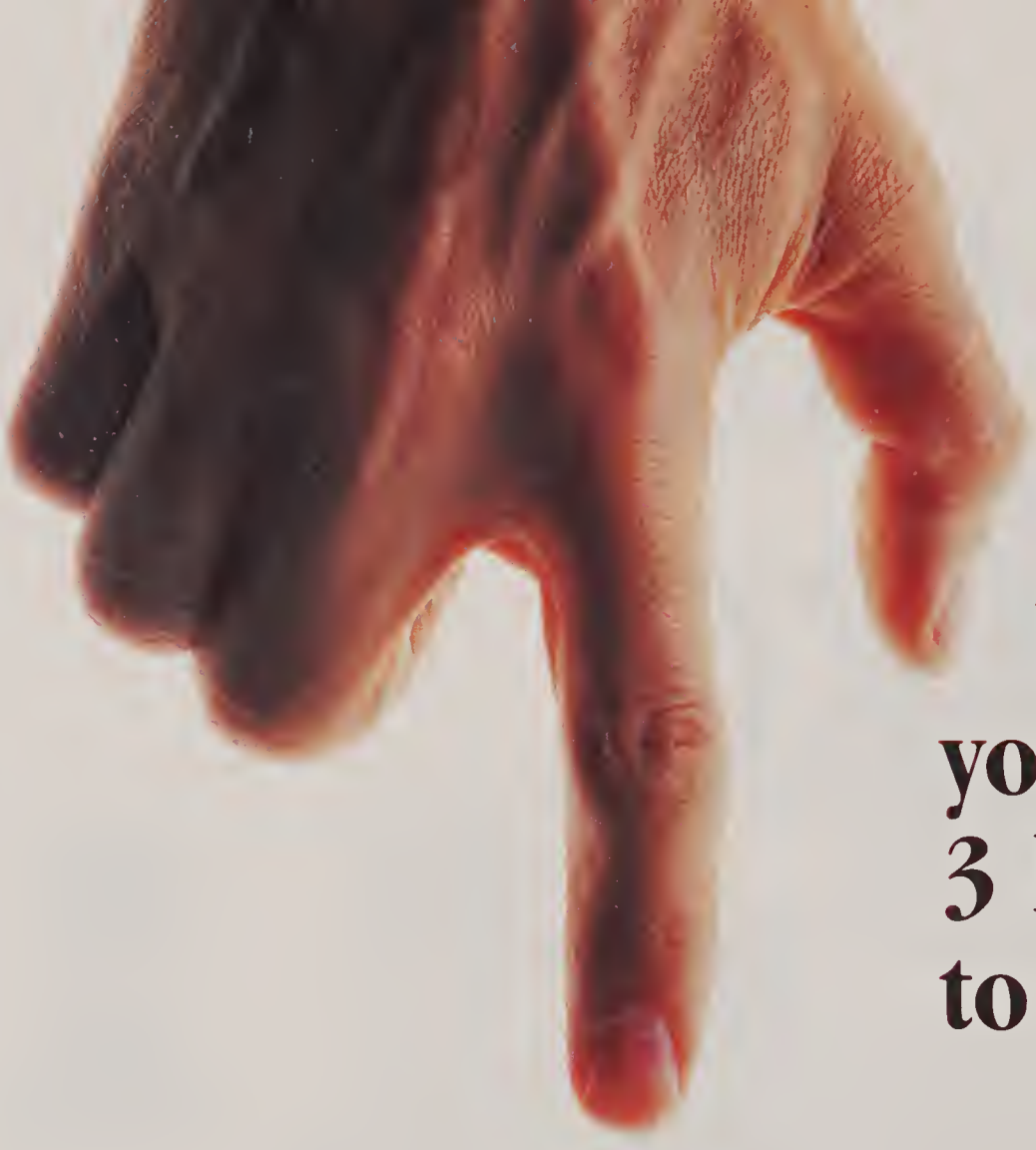
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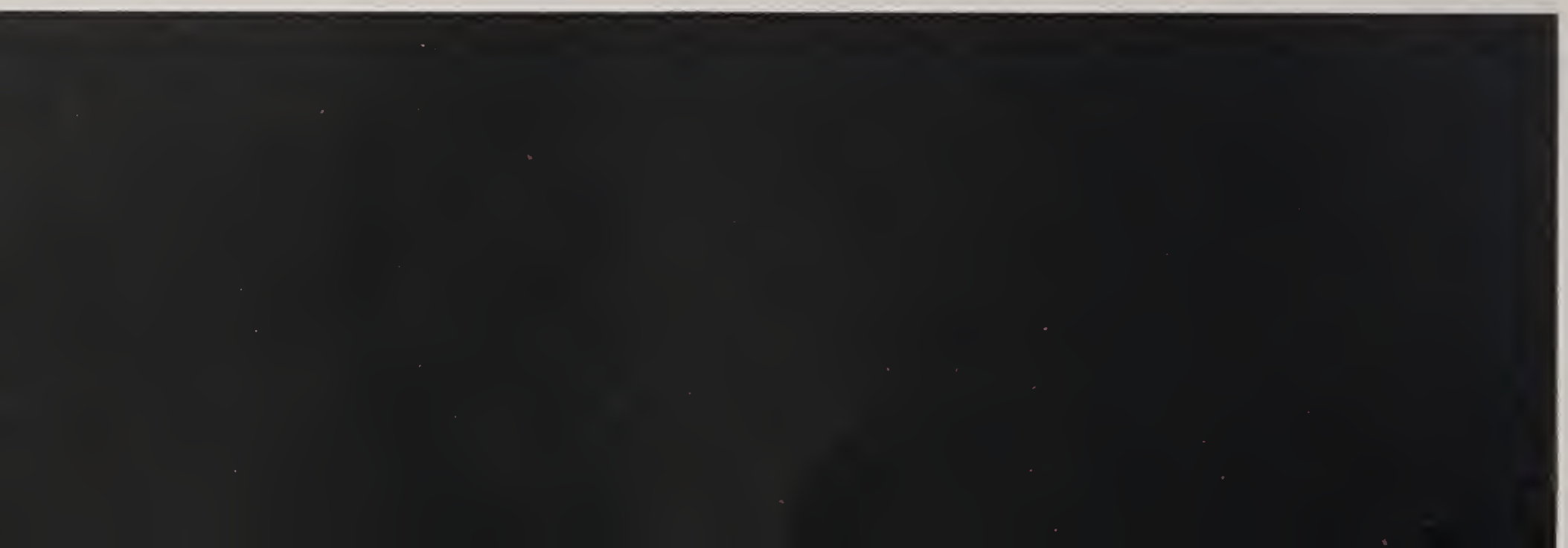
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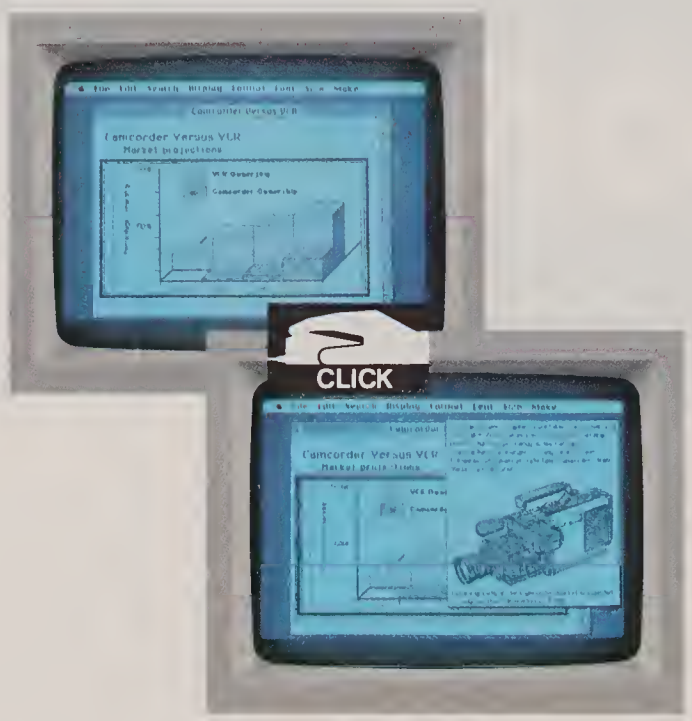
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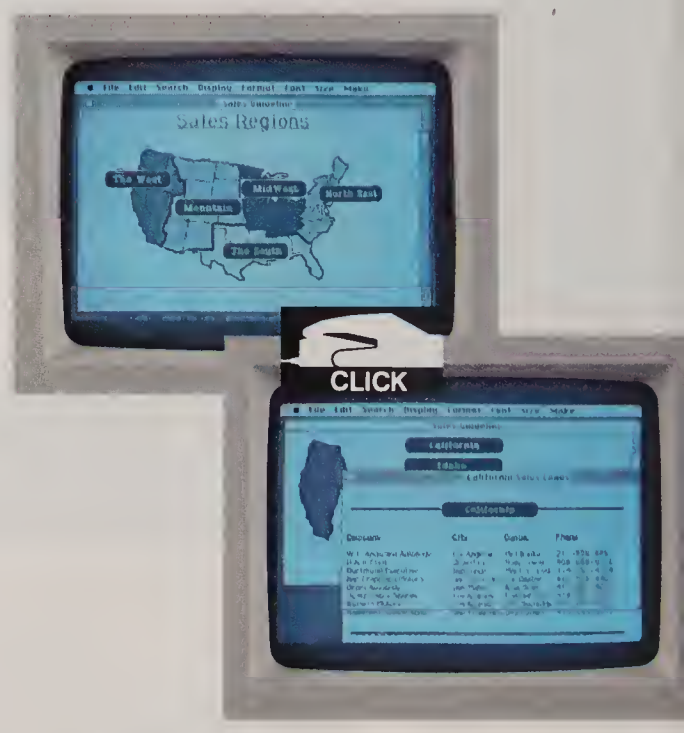
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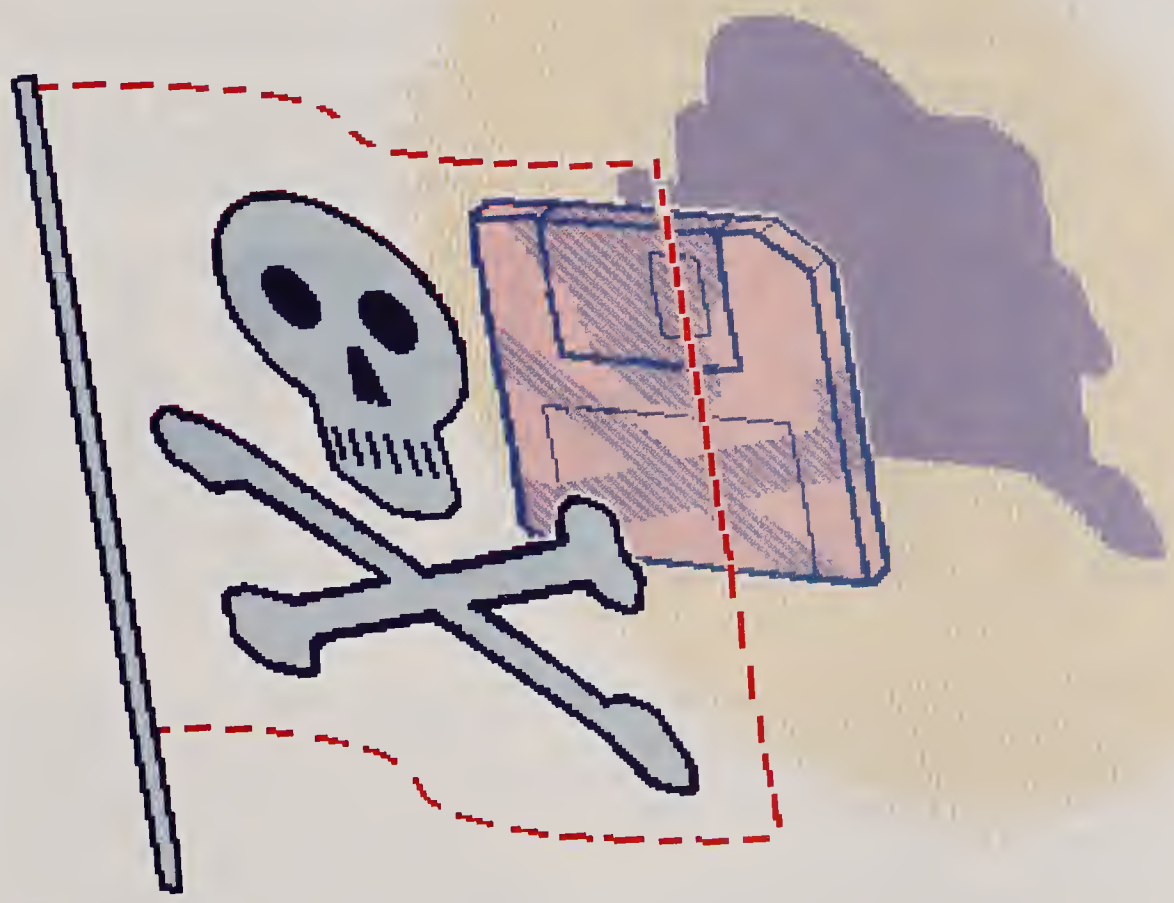
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Letters

A forum for Macworld readers



MICK WIGGINS

Mail-Order Cheers
Three cheers for your policy regarding Northeastern Software [*Letters, Macworld,* October 1986]. You have taken an unusual and laudable stand. I hope this helps me resolve my mail-order blues with Northeastern.

P. R. Williamson
Kirkwood, Missouri

See Jerry Borrell's column in this issue for more on mail-order.—Ed.

Does Not Compute
David Bunnell's column in November about Georgia's sodomy laws seems out of place in your magazine. Subject matter aside, I think that David's "call to action" abuses his position in order to preach his own platform for social change. My local newspaper provides all the information I need to keep me up-to-date and active on moral, religious, and political issues. *Macworld* is supposed to keep me informed on the Macintosh and how it relates to the computer industry. Keep up that good work, and don't let personal issues cloud your ability to provide what I pay for.

Michael Bailey
via CompuServe

Corrections
The phone numbers for X-10, maker of X-10 Powerhouse, *reviewed in the November issue, are 800/526-0027 and 201/784-9700 in New Jersey.*

The toll-free number for Haba Systems, publisher of HabaWord, *mentioned in the November* Macworld News, *is 800/468-4222.*

The Upgrading Game
When I recently upgraded my Mac to include a double-sided drive and 512K memory, two of my games stopped working properly, so I checked with the publishers of both. While Videx offered a Mac Plus-compatible upgrade of *MacGammon* for a small fee, Brøderbund replied that no upgrade is planned. I think $49 is a lot to spend for a 3½-inch disk, but what can I do except complain?

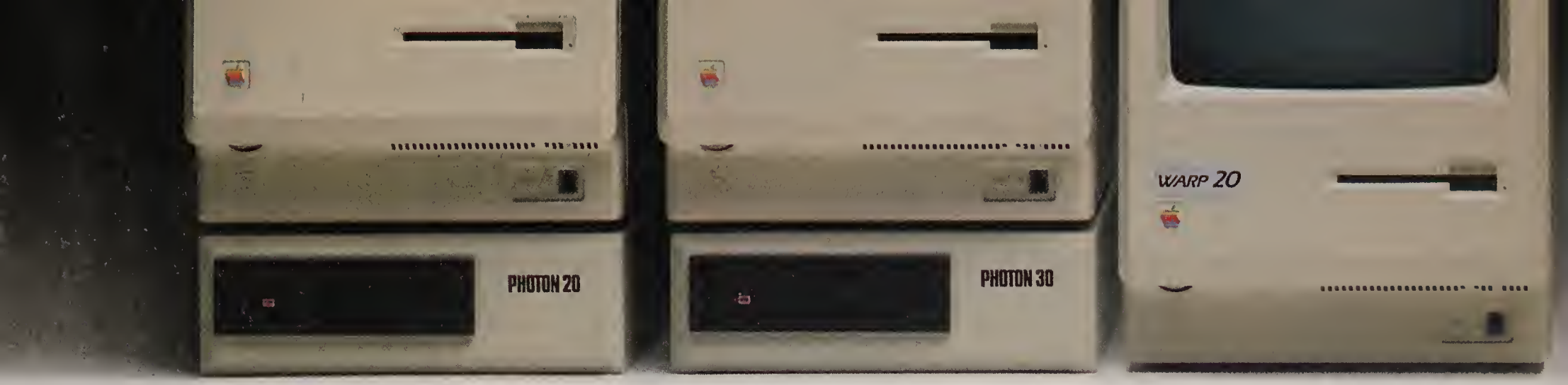
Robert F. Stanley
Arlington, Massachusetts

If you leave the game's System file intact and start up with the 400K disk that contains the game and its System file (rather than starting from a hard disk, for example), you should be able to continue playing your games. Another word of caution: Don't put such games in HFS folders, or the old MFS won't be able to find them.—Ed.

Hear, Hear on Software Rental
I couldn't agree more with David Bunnell's assessment of Congresswoman Pat Schroeder's misguided attempt to "protect" software companies from the piracy that they believe results from software rentals ["The Software Storm Ahead," *Macworld,* September 1986]. It offends me to be accused without provocation of some dastardly deed, and like Bunnell, I urge readers to make their feelings heard. But unless you're in Rep. Schroeder's Colorado congressional district, you're better off writing to your own representative. Address The Honorable Whoozis, U.S. Senate, Washington, DC 20510; or U.S. House of Representatives, Washington, DC 20515.

Jan Thomas
Columbia, Missouri

(continues)



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SCSI Compatible	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HFS Compatible	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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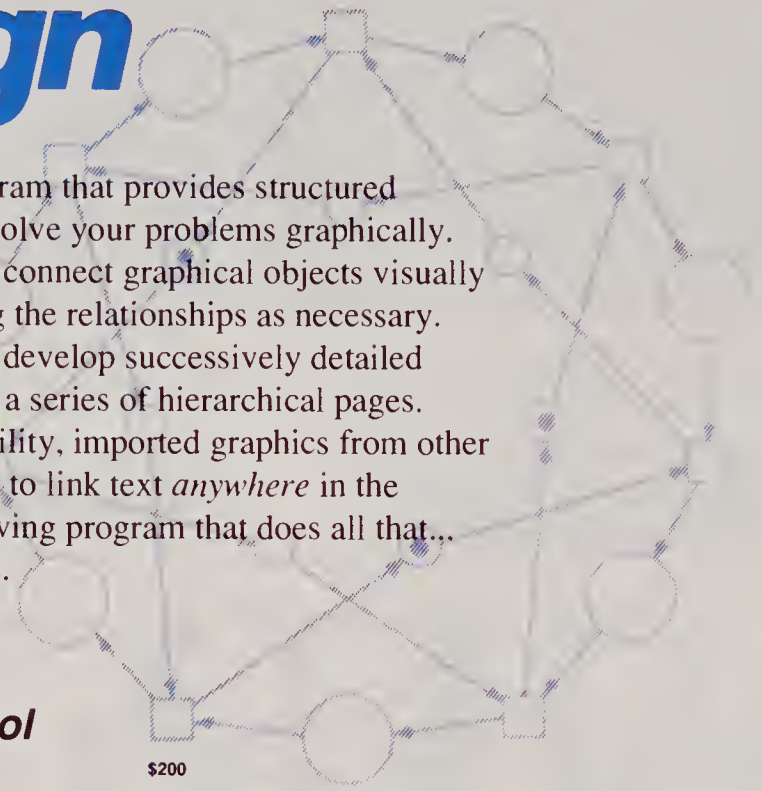
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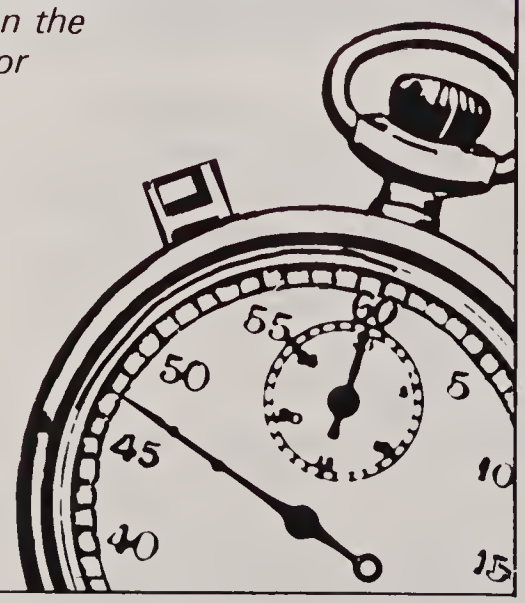
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Letters

Buying by Mail

Software buyers, beware of alluring cut-rate prices—discount prices may mean discount service in shipping and billing problems with Northeastern. Pay the extra dollar and get the red-carpet treatment from MacConnection. I found out the hard way that a dollar saved is not a dollar earned when the letters, phone calls, and lost time are added.

William K. Anawalt
Rigby, Idaho

A SoftStrip Writer

My familiarity with Cauzin's *SoftStrip* reader convinces me that it holds great potential for computer users. Your review [*Macworld Reviews,* October 1986] contained inaccuracies and overlooked some important considerations.

The desciption of the *Softstrip* reader made it sound like an optical character reader; however, it doesn't scan a printed page and encode the information in binary form. The *Softstrip* stripper reads data from disks and converts the binary files into a code of dots on paper that can be decoded by the reader.

It does not take 2.5 minutes to scan a Softstrip. It takes 25 seconds, regardless of density.

The product works with the IBM PC and the Apple II as well as the Mac, so once a program or data file is in *Softstrip* form, it can be read by any computer attached to a reader. The September issue of *Lotus* printed a 15K *1-2-3* worksheet (a general ledger and financial statement program) in *Softstrip.* I read it onto my Mac Plus and then opened the worksheet with *Excel.* It worked without a hitch the first time, and the whole process took only 5 minutes.

That's just one example of the many applications for this product. It's ideal for trial-size demonstration software. A Softstrip on a business phone bill or checking account statement would allow the itemized details to be transferred easily into an *Excel* template to produce reports and graphs. It would also be a great way to distribute courseware.

Many personal computer magazines, including Macintosh publications, use Softstrips editorially. *Macworld* is an exception. Keep in mind the big picture when looking at a product in a new genre like this one.

Ron Sheridan
San Mateo, California

(continues)

Compare.



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NO *Dove*

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NO *Levco, Dove*

3. Do I get extras like RAM disk and print spooler software?
YES ***MacMemory, MaxPlus***
NO *Levco, SuperMac*

4. Will I have toll-free technical support and the longest board warranty available? *(Two years)*
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5. Am I getting the most for my money?
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**Data compiled as of December 1, 1986. Competitive products compared: Levco: OnePlusOne. Dove: MacSnap2, SuperMac: SuperRAM. MacMemory. MaxPlus.*

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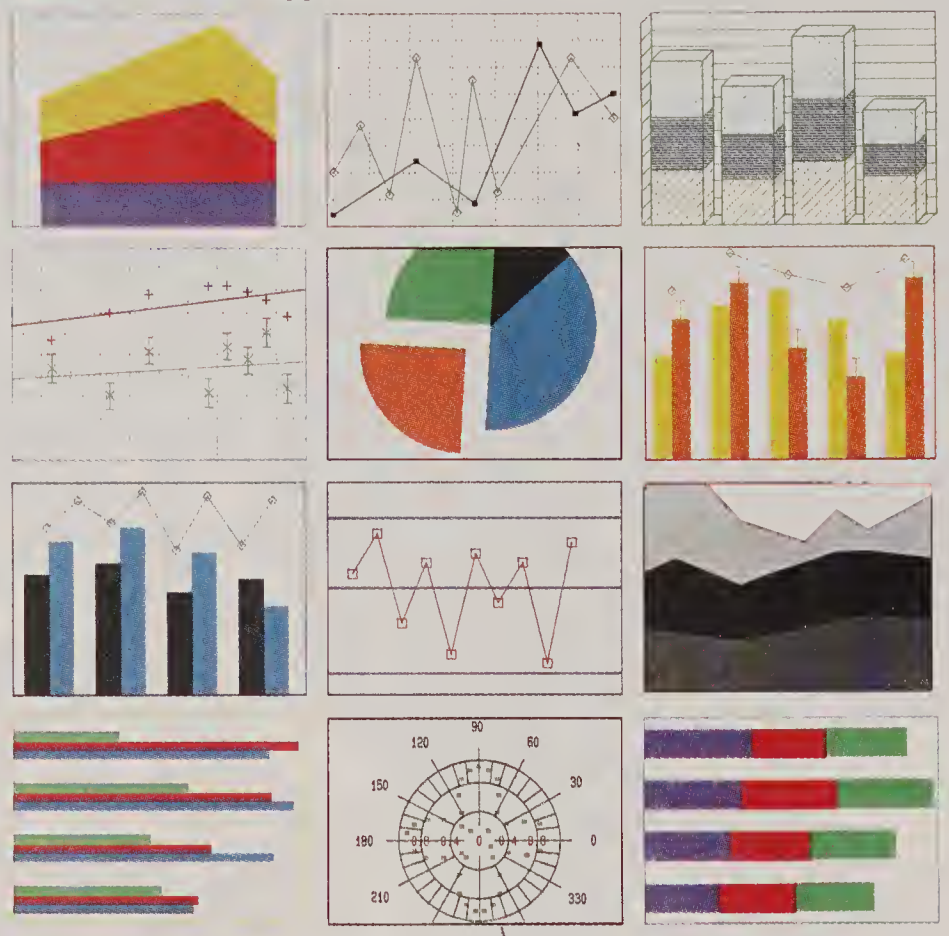
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Letters

Reviewer Gordon McComb executed many time tests; the average reading time was 2.5 minutes, including alignment and responding to dialog boxes. Measuring only the scanning time would have been misleading.

We agree that the product has the potential to solve many problems simply, but real questions remain about convenience, reliability, and user acceptance. Until we know that more than a handful of our readers use the Cauzin system, we'll continue to use the editorial columns for information that's accessible to all our readers. If we start printing Softstrips, we have to stop printing something else to make room.—Ed.

The Mac's Future in Medicine

I was fascinated by the news item about plastic surgery and the Mac in September's *Macworld View*. I did something similar instead of plunking down $30,000 for a turnkey system (that uses another microcomputer) for predicting plastic-surgery results on the computer screen. Most video cameras I tried with MacVision horizontally distorted the patient's face, so I've settled on ThunderScan to digitize photographs, which I then trace with *MacPaint* or *FullPaint*. I can transfer the images into *MacDraft* and superimpose all sorts of facial measurements to help design facial reconstruction procedures. The most fun, however, is producing surgical or anatomical demos with *VideoWorks*. The possibilities are unlimited: combining video with cartoon cutaways to show inner structures, building a human hand by starting with the bone and then adding each muscle, or depicting the embryological development of the hand. I believe the Mac has a great future in medicine.

William B. Webber, M.D., FACS
St. Louis University Medical Center
St. Louis, Missouri

Don't Stray from the Subject

David Bunnell's editorial in the November 1986 issue was not appropriate. We all have opinions on current topics, and in this country forums exist for virtually every opinion on any subject. I happen to agree that Georgia has passed a bad law, but I am seriously disappointed to have spent money for insights into the Macintosh and to have received opinions on sexual behavior instead.

M. Ray Brooksby
Cupertino, California

(continues)

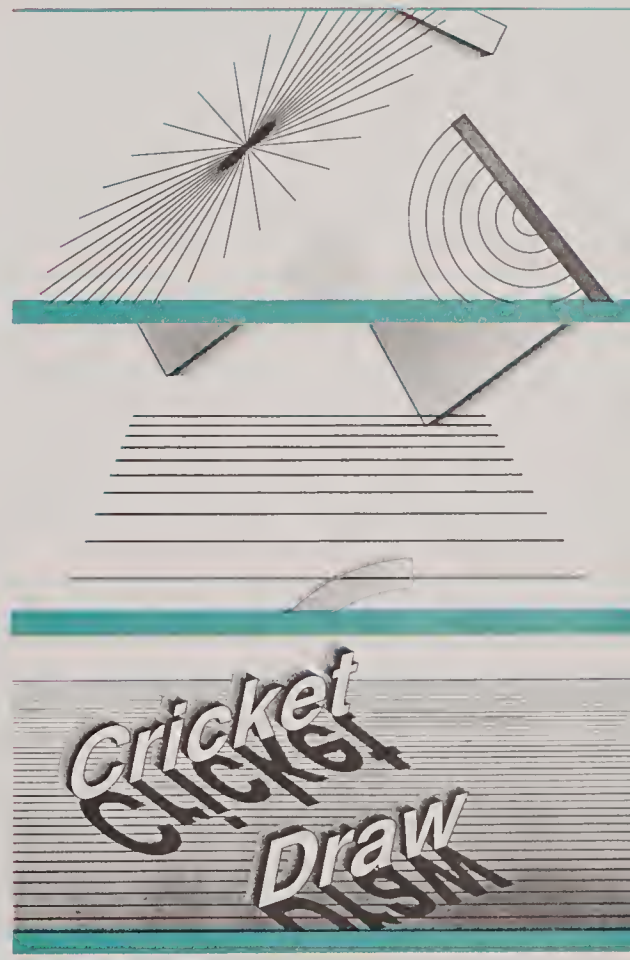


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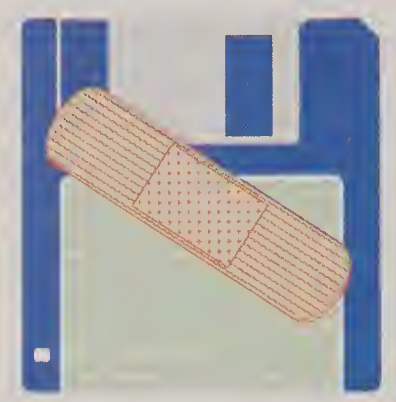
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Letters

Try a New CAD Approach

Notwithstanding the enthusiasm of Paul Freiberger and Dan McNeill for the Mac as a contender in the CAD market ["Desktop Engineering," *Macworld,* September 1986], we see little hope for the Mac unless developers of CAD software begin to recognize that the CAD systems are–or should be–database managers. With the recent arrival of the MS-DOS-compatible *Digicad,* which has its own database manager, some of us who have pushed to get the Mac into this field face a severe obstacle. We would not purchase it now, based on the Mac's existing CAD software. However, if the features and functionality of *Digicad* were available for the Mac, we could justify both the Mac and the LaserWriter for stand-alone CAD use.

C. A. Nichols, Jr.
Naval Electronic System
North Charleston, South Carolina

CAD Complaints

Every Macintosh CAD product I've seen has had serious problems. I don't mean poor use of the Mac metaphor, or poorly designed menus, or even clumsy ways of creating visuals for geometry, though the programs are replete with these. I am talking about mistakes in their fundamental knowledge of technical graphics. They either move the axes around in a nonstandard orientation, transpose scale specifications, or misname concepts like translation, rotation, and scaling. Where do these companies get their graphics advice and knowledge? From programmers? From math whizzes? From the janitor?

I know of no member of the Engineering Design Graphics Division of the American Society of Engineering Education–professionals who have spent their lives studying graphics methods, procedures, and techniques–who has been approached to advise these companies. It's a sad state of software affairs.

Jon M. Duff
Purdue University
West Lafayette, Indiana

Still Bugged by FORTRAN

In a letter in your October 1986 issue, Michael Treacy complained about bugs in Microsoft FORTRAN, and your reply downplayed their importance. My experience has uncovered some bugs that are not minor. The symbolic debugger sometimes

(continues)

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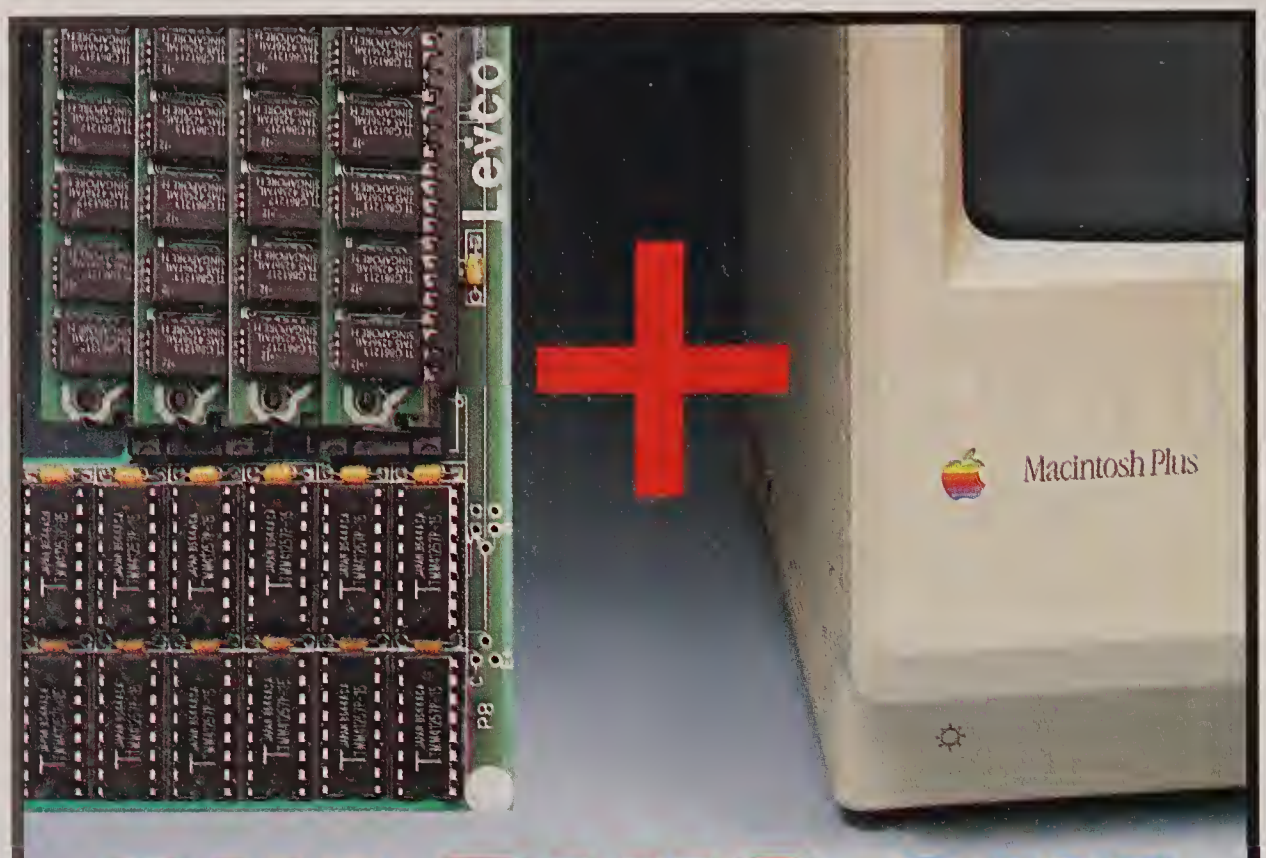
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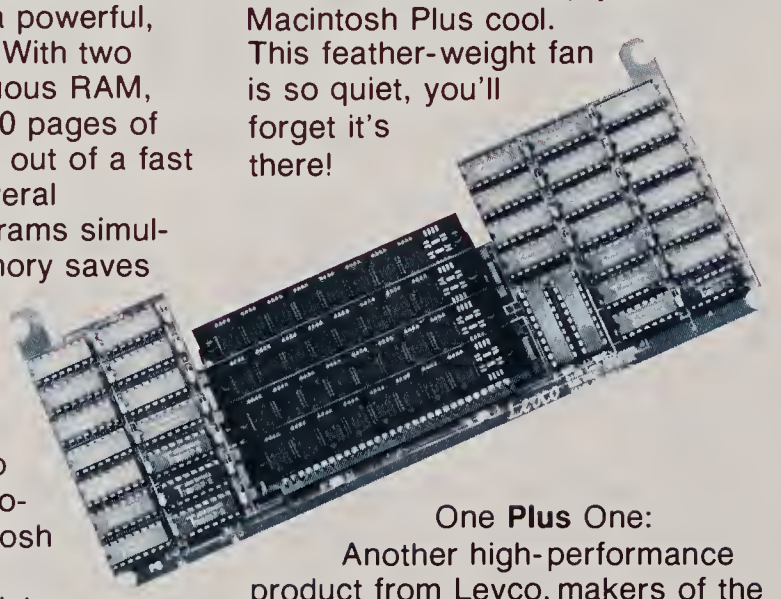


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becomes unstable and causes the Mac to crash. Neither the compiler nor the run-time library allow you to open more than three disk files at a time; standard FORTRAN has no such restriction, and the Finder certainly allows more than three files to be open simultaneously. Your reviewers should have spent more time actually using the program to produce a more accurate review, instead of insufficiently covering ground and leaving the reader with more questions than answers. I don't believe *Macworld* should turn into another *Byte,* but it's time to stop underestimating the intelligence of your readers.

Norman Bucknor
Brooklyn, New York

Absoft, developer of Microsoft FORTRAN, has already come up with a patch for the problem with the symbolic debugger; it's available on CompuServe's MACDEV, DL1. Support technician Richard Smith says the default number of files that can be open simultaneously is five, with the theoretical limit of 5000 on a Mac Plus, so maybe you missed something in the documentation on the Linker. Contact Absoft technical support directly at 904/423-7587 if you need help.—Ed.

More on Bugs

I agree with Michael Treacy that the FORTRAN compiler offered by Microsoft has many frustrating minor difficulties. Fortunately, bugs in the parts of the compiler that do not interface with the Macintosh are rarely seen, so a purely computational program with little or no input and output is likely to work well and be as fast as anything on the Mac. However, the developers should realize that the many simple problems with the compiler blossom into time-consuming bugs when the user is debugging a new program and is also trying to isolate new compiler problems while working around known ones.

Pete Mahqwald
Stanford, California

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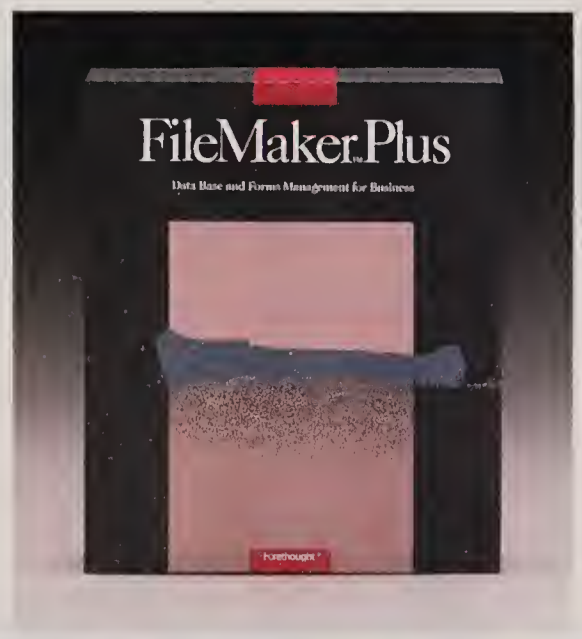
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THE HYPERDRIVE INTERNAL HARD DISK.

If you're among the inner-directed, we can help you mold a Macintosh in your own image.

Through HyperDrive 10 and 20—the first hard disks to be installed *inside* the Macintosh and connected directly to its microprocessor.

The resulting Macintosh can, in its own quiet and very unobtrusive manner, outperform any other Macintosh in its class.

It can not only store as much information as 25 or 50 diskettes. But it will also reduce power-up time by 66% over a Macintosh Plus. Load Aldus' PageMaker 150% faster. Microsoft's Excel 250% faster. And so on.

Which should more than satisfy anyone's need for speed. Unless, of course, you need something "lightning fast," which is how Macworld magazine described HyperDrive 2000.

This internal hard disk system also includes an additional microprocessor and a floating-point processor—turning the Macintosh into an authentic number-cruncher. In fact, a Mac with HyperDrive 2000 can perform computations from 10 to an astonishing 250 times faster than a Mac Plus. And it can run far more sophisticated software.

All these HyperDrives can be networked with regular Macintoshes through our HyperNet software. And since they're internal, all three preserve the Mac's portability.

But sheer speed aside, what distinguishes all HyperDrives is the software they're equipped with. Which you can learn more about by consulting the ad on the right.

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THE HYPERDRIVE EXTERNAL HARD DISK.

The FX/20 and FX/40 are the most outgoing members of the HyperDrive family.

They spend their time on desktops, in the company of other office tools, and connect directly to the Macintosh's SCSI port.

The resulting Macintosh is extremely fast, which will come as no surprise to anyone familiar with HyperDrives. (If you aren't, see the fourth paragraph of the ad to the left.)

Nor is it surprising that our FX series is so accommodating, providing a vast 20 or 40 megabytes of storage.

The real surprise, at least for those familiar with external hard disks, is all the software the FX comes with.

Such as a program that protects your documents by making back-up copies of them onto diskettes.

Another program protects your documents from certain excesses of sociability—denying access to anyone who doesn't know the password you choose.

Still another program automatically queues up documents for your printer, which means that you can proceed on to other jobs without having to wait for your printer to catch up with you.

In short, no other external hard disk does everything that HyperDrive FX/20 or FX/40 does. A distinction it shares with the internal HyperDrives on the left.

And over 1200 authorized General Computer dealers will be happy to help you establish a meaningful relationship with either. For the dealer nearest you, call (800) 634-9737.*

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No-Ware Land

Opening the Pandora's box of mail-order sales

"Having read the letter in your October Letters to the Editor column, I'm writing to say that I too . . ." That is how many of the 75 letters I have received to date about Northeastern Software begin. Never have I seen such an upwelling of anger and frustration over a single supplier. The letters recount endless hours spent trying to obtain products or secure refunds from Northeastern, one of the largest computer products mail-order firms in the United States.

The writers' horror stories sound something like this:

"I recently ordered a product from Northeastern, and my credit card account was charged. Unfortunately, I have never received the product. I spent hours trying to get through on the ever-busy phone lines. When I finally reached someone, I was put on hold again before being assured that the problem would be solved. To date [weeks or months later] I've received no [product/refund/explanation]. As I cannot find someone to resolve the matter at Northeastern, I have contacted my credit card company directly and explained that I was improperly charged."

I've seen many variations on the theme, but most fit this model. I should point out that such difficulties have *not* characterized other firms that provide mail-order services. On the contrary, these same writers took the time to praise Mac Connection, Programs Plus, Icon Review, Telemart, and Tussey. We do receive an occasional complaint about some of them, but these cases appear isolated. With Northeastern Software the situation has fallen into that gray area between ineptitude and fraudulence.

Last summer I brought Northeastern's repeated foul-ups to the attention of our publisher, Jim Martin. Jim wrote to Northeastern president Richard Grabowski warning that Northeastern's practices, if not remedied, could cost the company its right to advertise in *Macworld*. No small concern, as Northeastern's business represents tens of thousands of dollars to *Macworld* and *PC World* magazines.

In our October issue, the letter "Mail-Order Blues" appeared and the sky opened up—in international scope. We received letters from across the United States and from Canada, Japan, Sweden, and Belgium. The vitriol they expressed told us that we had struck a nerve. Said one reader, "What I discovered is that you can order products by phone, but that's all you can do." As a group the letters document gross negligence in business practices: wrong product versions sent, IBM and Apple II software sent to Mac users, and so on. Readers have complained of waiting from 2 to 11 months for Northeastern to resolve their dilemmas.

Almost all the readers made a final point: such experiences damage the reputation of the entire mail-order industry. Moreover, many question our magazine's ethics in accepting advertisements from such a company.

I sent copies of the most recent letters to David Bunnell, the editor-in-chief of all PCW Communications publications, and to Jim Martin. I pointed out that the situation seemed to be worsening.

Jim Martin responded by immediately drafting a letter to Northeastern to refuse advertising from the company (beginning with the December issue) until sound business practices had been restored and until all our readers' complaints had been resolved. David called to inform Richard Grabowski of our upcoming action.

Mr. Grabowski explained that our ad embargo would likely result in the dissolution of his firm. He explained that recently received bank financing was allowing his company to remain solvent, and that if Northeastern were forced to close its doors, our readers would suffer more. David explained that we could no longer ignore the matter, given our readers' response.

At press time we learned that Northeastern had filed for protection under Chapter 11 of the bankruptcy code. The company is not out of business, but the move holds creditors at bay while Northeastern attempts to regroup.

What's it all mean?

Whether Northeastern's poor service was caused by chaos or calculated disorder (much like the E. F. Hutton check-kiting scheme) probably doesn't matter to the customers left hanging. Perhaps the biggest mistake Northeastern made was keeping our readers on hold for several hours—time many of them spent writing to *Macworld*.

Readers learned the hard way that they have little recourse other than calling the Better Business Bureau in Connecticut (where Northeastern is notorious), the postmaster general (who has no authority in the case of a credit card purchase made over the telephone), the Connecticut attorney general's office, or the Department of Consumer Protection—none of which has taken action thus far. Those who ordered with Visa or MasterCard can have their accounts credited if the companies are notified soon enough.

While we at *Macworld* cannot act as a consumer protection agency, we are keeping track of all the complaints received. As we learn more, we'll continue to inform the people who have written to us. Next month we'll run an article on the mail-order industry, including the latest word on Northeastern. You should also check our *Mac Bulletin,* as we're able to insert breaking news there just before press time. □

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Contributors Notes

Dennis Cohen *("Pascal Two Ways") is a software analyst at Ashton-Tate. He is also chairman of the Apple and Modula II special interest groups of the University of California, Davis, Pascal System Users Society.*

Robert C. Eckhardt *("Glimpsing the Future with Guide") is a frequent contributor to* Macworld *and the author of the forthcoming books* Free (and Almost Free) Software for the Macintosh, *to be published by Crown, and* The Fully Powered Macintosh, *to be published by Brady.*

Danny Goodman *("Macintosh in Flatland"), a* Macworld *contributing editor, has worked on the Mac since before its release. He has written and lectured extensively about* Microsoft Excel, *and his most recent book is* The Apple IIGS Toolbox Revealed, *published last year by Bantam Books.*

Jim Heid *("Getting Started with Backups") is a contributing editor of* Macworld *and the author of* dBase Mac in Business, *published in 1986 by Ashton-Tate Publishing Group.*

Prasad Kaipa *("Mac E-Mail Comes of Age") is an assistant professor of radiobiology at the University of Utah, where he has been researching the effects of radiation fallout. He also consults on Mac application programs through his firm, MacWiz Consulting.*

Steven Levy *writes a monthly column for* Macworld *and is the author of* Hackers: Heroes of the Computer Revolution, *now published in paperback by Dell.*

Steve Mann *("Mac Tax Tools") is a freelance writer and was formerly a microcomputer specialist with a Big Eight accounting firm. He is a frequent contributor to* Macworld *and writes a personal investing column for the* San Jose Mercury News.

Michael Miley *("Mac E-Mail Comes of Age") is a free-lance writer and editor who recently founded a firm that specializes in individual and corporate biography.*

Allen Munro *("Pascal Two Ways") conducts research on intelligent computer-based training at the University of Southern California. He is the author of* Mac Power: Using Macintosh Software, *published in 1985 by Scott, Foresman.*

Erfert Nielson *("Font Facts" and "Insights on MacPaint") was a founding member of the* Macworld *staff who specialized in graphics. Now a contributing editor, she sandwiches her assignments in between treks to the Far East, the Midwest, and the Trinity Alps.*

Lon Poole *has been educating Macintosh users since the machine was introduced. He helped found* Macworld *and has contributed articles regularly. Every month he answers readers' questions in the* Quick Tips *column. He has also authored two Mac books:* MacWork MacPlay, *a beginner's workbook, and* Mac Insights, *a collection of tips, shortcuts, and enhancements, recently published by Microsoft Press.*

Stuart Silverstone *("Newsroom Graphics") was trained as an architect and has taught computer graphics and visual communications in the architecture department at MIT. He has designed informational graphics for the UPI news wire service. He is currently a consultant and writer who focuses on Macintosh graphics.* □

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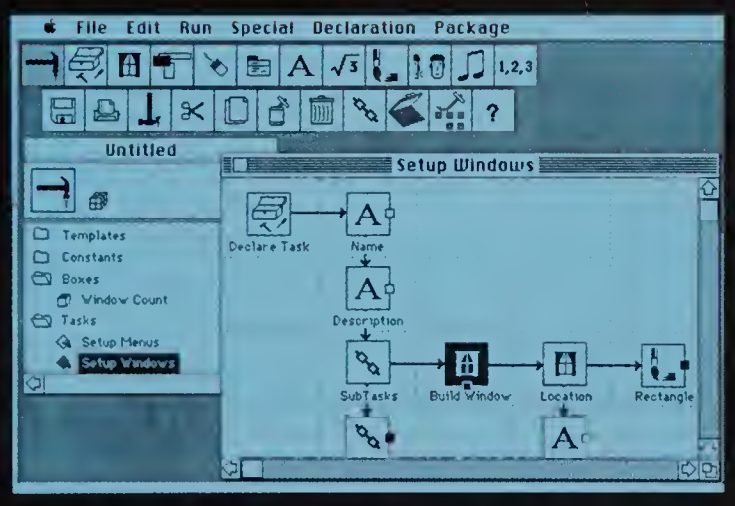
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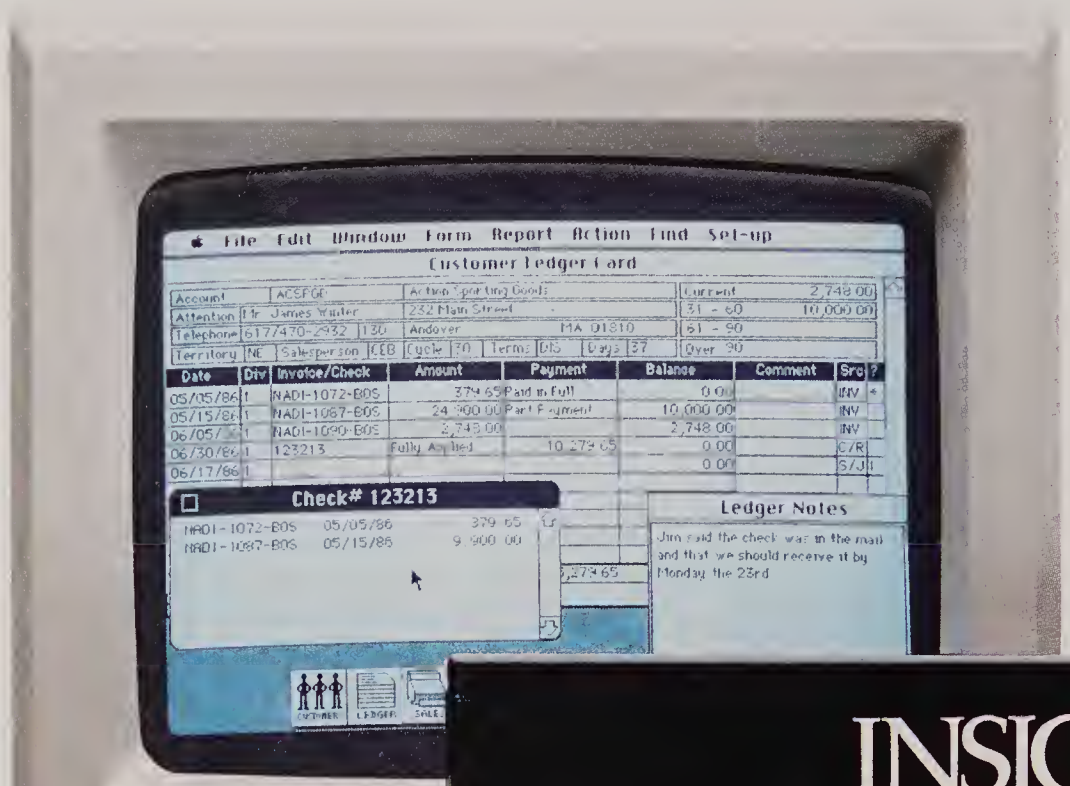
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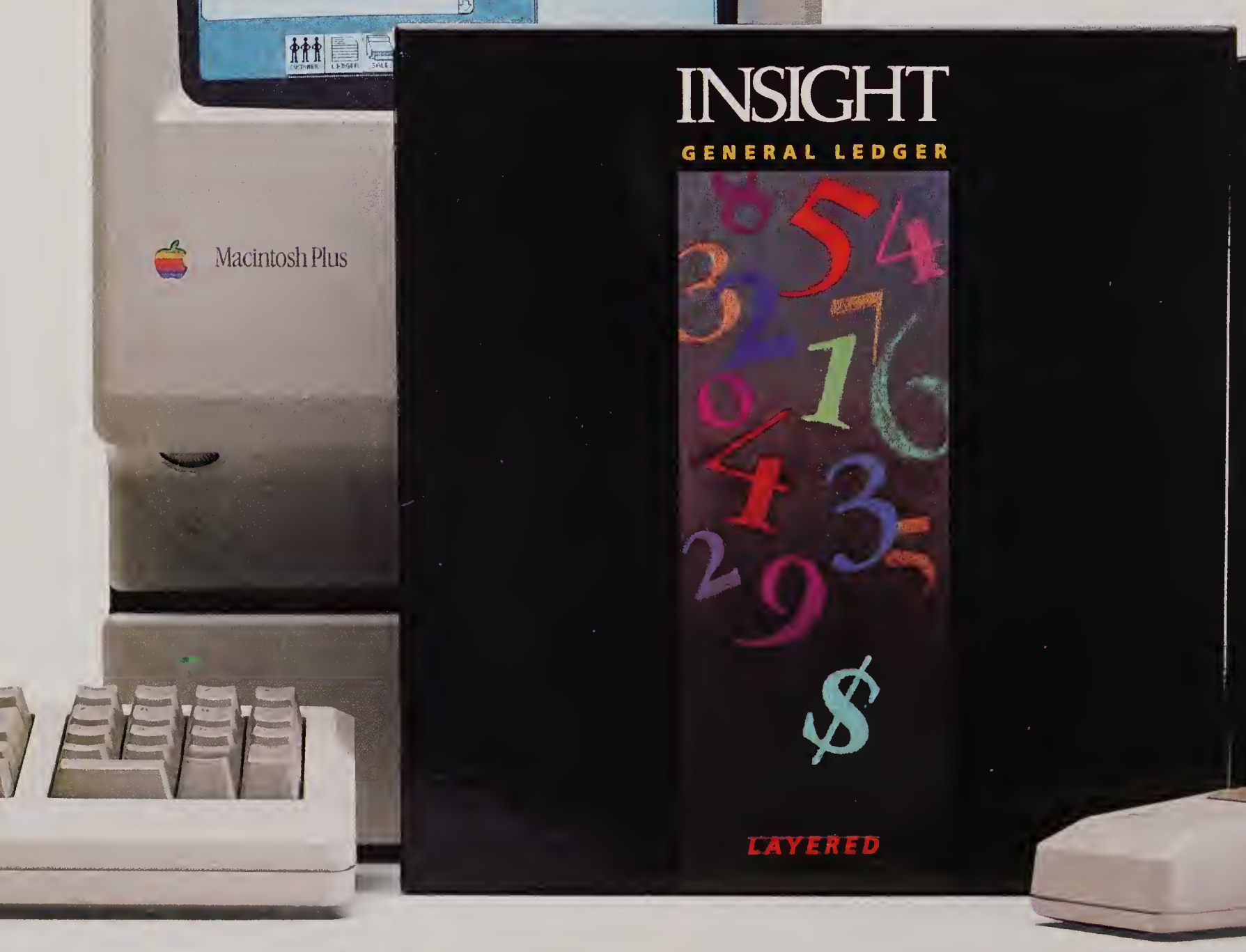
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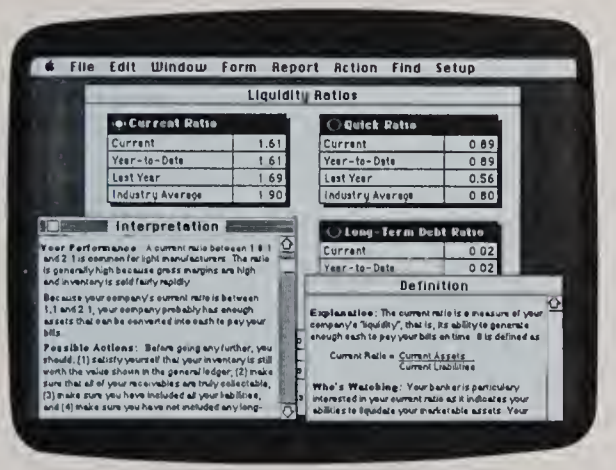
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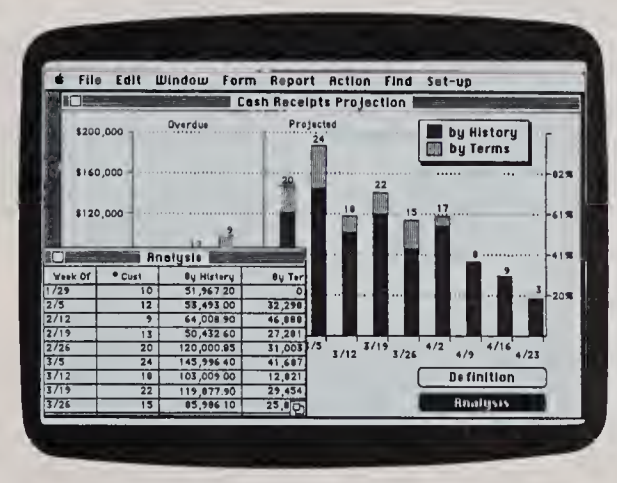


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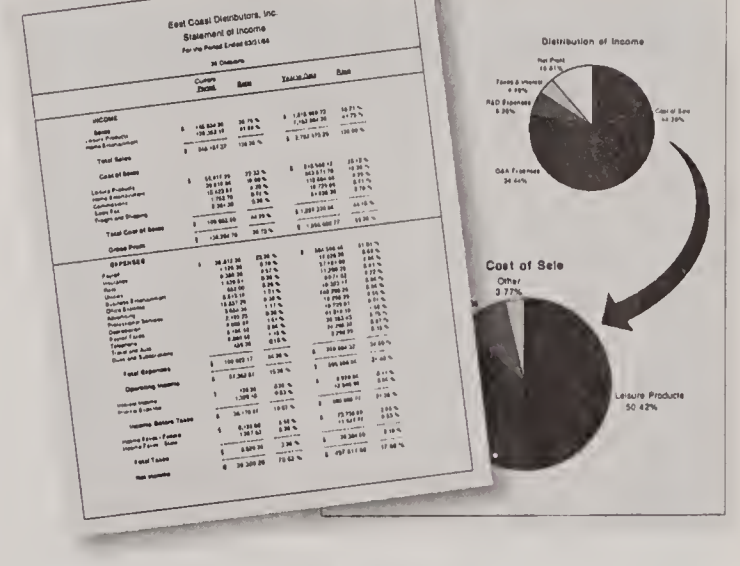
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The Macintosh Journal, May 1986
MacUser, October, 1986

"Spellswell is an excellent spelling checker being relatively fast, and containing a number of features not found in any other spelling checker." *Computing Today Vol 1, Issue 23*

"It's a super spell checker for the Macintosh—the best out there."
John Dvorak, InfoWorld, May 26, 1986

"...unusually well designed...Spellswell is an impressive spelling checker for the Macintosh. It is very easy to learn and use, and the vendor provides responsive support."
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"It is easy to use, easy to learn, and performs flawlessly...Spellswell is definitely the best value of all the programs I reviewed."
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Steven Levy

In Search of the Ultimate Word Processor

Now that the Mac qualifies as a writer's tool, what can we expect in the future?



MAX SEABAUGH

Microsoft went all out to let everyone know that its announcement of *Word* version 3.0 was a very big deal. There was an elaborate dog-and-pony show at no less distinguished a venue than New York City's Guggenheim Museum. Dogs and ponies included Microsoft chairman Bill Gates, Apple's visionary-with-portfolio Jean-Louis Gassée, the president of a national association of secretaries, and author Tom Clancy. (Mr. Clancy, who writes military potboilers, couldn't get over how neat word processing was.) There was a short movie, set in 1936, with a Max Headroom-like character inside a Mac who divined the future of writing for a typewriter-bound hack. And there was a press release that informed us that this version of Macintosh *Word* has "revolutionary new features that make it the best document processor on any personal computer."

The buzzword at the Guggenheim was *breakthrough,* and what we toner-stained wretches were to understand was that this program had opened up a new dimension in the short but crowded history of word processing.

Word 3.0 is not the only newcomer to the Mac community. Now that *MacWrite* is no longer shipped with every Macintosh, third-party software publishers have the incentive to undertake the major effort to produce heavy-hitting word processors. Ergo *WriteNow, Laser Author,* and a variety of other contenders (see "Writing Your Own Ticket," *Macworld,* December 1986). In the wings is a Mac version of *WordPerfect,* the most fully featured writing program in the MS-DOS world.

I sense that the real breakthrough is that, after a shamefully extended dark age, Macintosh word processing is finally as good as the competition's. But how good is that? The question demands perspective. Perhaps it's now time to determine how far we've come in pursuit of the ideal writing tool. What *is* the Ultimate Word Processor and how close are we to finding it?

The Long and Winding Scroll Bar

Word processing started as a lark. Tracing its origins as far back as I could, I found that people began using computers to handle English text strings in the late fifties at

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MacUser EDITOR'S CHOICE AWARD 1·9·8·6

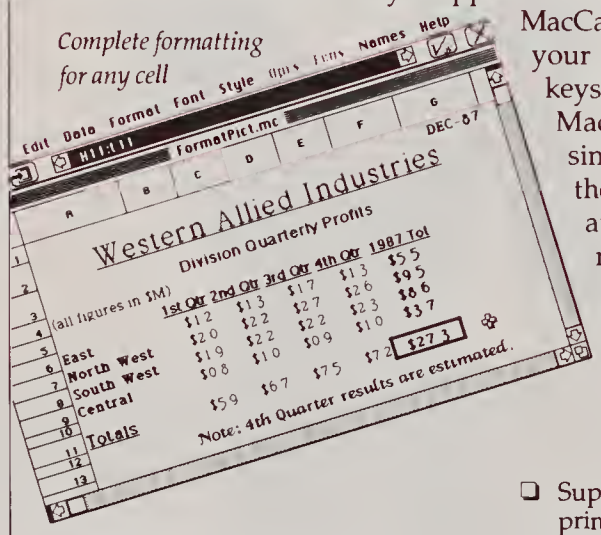
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Circle 588 on reader service card

Steven Levy

MIT. A hacker jokingly called the original program *Expensive Typewriter.* Programs that edited computer code evolved into word processors. In the seventies, "dedicated" word processors became popular in offices. But it took the microcomputer to bring word processing to the masses.

The days when word processing was like a religion—when recent converts buttonholed people at parties to preach the miracle of cut-and-paste—are long gone. Almost everybody, Tom Clancy excepted, takes its wonders for granted. You still see an occasional article by a willfully ignorant holdout; the most recent example is Alexander Cockburn's screed in *Mother Jones.* Cockburn sees word processing as a technocratic hoax; to portray his distance from the trendies who have fallen for the scam, he is shown with his preferred writing tool, the typewriter.

But typewriters will eventually be remembered as the interim step between pencil and computer. Their advantages were legibility and speed, their disadvantages, a painful learning curve, a lack of control over revision, and the anal-retentive effort required for decent-looking output. It seems to me that the most difficult part of word processing is *typing*—going from pen to typewriter is a much more drastic adjustment than from typewriter to computer.

The design problem of word processors has always been the difficulty of recapturing some of the simplicities of hard-copy writing: cursor control, attempts at WYSIWYG (what you see is what you get), and pagination-on-the-fly are all attempts to make the computer behave more like our familiar pencil and paper. At the other end of word processor design are additional features that would be inconceivable without computers—spell-checking, search-and-replace, automatic footnoting, outlining, and other time savers.

Simonyi's Law

I decided to talk to some people about what the Ultimate Word Processor, or UWP, should contain. First I consulted Charles Simonyi, former wizard at the famed Xerox PARC facility and now a programming guru at Microsoft. Simonyi has been involved in word processors for over a decade. Not coincidentally, he has been the guiding light for *Word.*

(continues)

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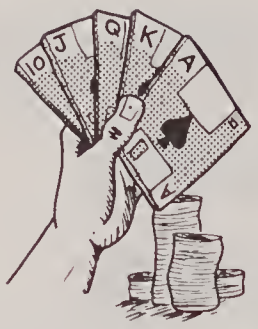
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Steven Levy

Simonyi believes, as do most people I spoke to, that the big strides in word processing have already been made. In fact, when I asked Simonyi which features of today's word processors would have blown him away if he'd seen them ten years ago, he said, "price and availability," rather than the programs themselves. It seems the great stuff we enjoy now was all envisioned, if not implemented, at PARC a decade ago.

Furthermore, the admittedly biased Simonyi thinks that *Word* 3.0 is the first program powerful and simple enough to support the changes and improvements that will make it the Ultimate Word Processor. To explain how, he first describes word processing design as a three-pronged dilemma–the triad of speed, interface, and features.

As programming improves and computers get more powerful, speed always increases. Breakthroughs come with huge leaps in how fast a program performs a task. For instance, the old version of *Word* took its own sweet time saving long files. So much so that one might suspect Microsoft had it in for people who needed more than 40K of document space and was exacting slow revenge. *Word* 3.0 greatly cuts that time, and it gives immeasurably more power to those with long files.

"Your Page Breaks, Sir?"

What about the interface? Here, a struggle ensues between keeping it simple and offering lots of options. Windows, mice, and other Mac-like features help out greatly. Still, Simonyi explains, it's a question of real estate. With only so many prime locations on the keyboard for frequently used functions, more esoteric ones get shunted to the suburbs or the backwoods (Option-⌘-ville). Simonyi thinks further interface improvements will come with the advent of what his boss Bill Gates calls "softer software."

"It's like the English valet who stands in the background," he says. This valet will change the on-screen menus and create macros automatically, by carefully observing how you use the program. For instance, if every time you type the words *Wall Street Journal,* you then go back and italicize, the valet will figure out that you might want that done for you. Scriptwriters will see their work output in screenplay format without the tedious job of cutting and pasting different kinds of paragraph formats; the valet will figure out how to set up the structure.

Another task the valet might take on is the work of various "writing analysis" programs. Yes, I unhappily conclude that the Ultimate Word Processor will have some schoolmarmish aspects. I guess I can bear it when a program informs me that my sentence doesn't parse, or that I used the word *very* six times in one paragraph. But I just hope we can easily toggle off the built-in grammar czar that hoots, "tired usage!" or "too verbose!" Further down the road are other horrors: I dread the day when the program checks *Collected Works of All Known Authors* from the on-line compact disk and confides, "Norman Mailer said the same thing, buddy, and a heck of a lot better."

Rappin' Raskin

Jef Raskin, the original designer of the Macintosh, has some different ideas about what sort of interface the UWP should have. As one might expect from the mind behind the ultrasimple Swyftcard writing tool that plugs into a slot on the Apple IIe, Raskin urges a bare-bones approach: "Simplify things by an order of magnitude," he urges, noting that Swyftcard does everything most "big" programs do using only five commands. I asked Raskin whether we might expect a Swyft-like product for the Open Mac, and, not committing himself, he acknowledged the possibility.

Raskin assumes that eventually word processing and typesetting functions will merge. "The two needn't be separated at all," he says. "There should be no difference between making something uppercase and making it Helvetica 12-point." While Raskin thinks that our current word processors are good, he points out that "in personal-computer-generated typesetting we don't know what good *is* yet."

But that's getting into page-layout programs, a bit beyond our range. Are you saying, Jef, that the word-processing breakthroughs have already occurred?

"I'd hate to say there won't be more major breakthroughs. You might as well have predicted in the 1800s that people would never be able to fly."

Finally, I asked Raskin if he could think of a worthwhile feature not yet included on any processors. "A scheme for communicating edits," he promptly replied. This suggestion warmed my heart,

(continues)



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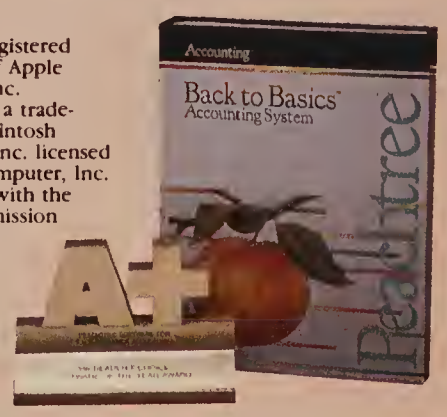
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because several years ago, after bemoaning that very failing, I went so far as to scribble some design notes for an editing system called *Blue Pencil* that would allow editors to insert proofreading marks, write comments in the margin, and cross out words, with the suggested replacement above. The author could then either implement or overrule the changes.

When I published those notes in the now defunct *Whole Earth Software Review* two years ago, nothing like it existed. But now a Mac program called *Document Compare* lets you display two *MacWrite* files side by side and see the differences highlighted. A step. Better yet, a new program called *Red Pencil,* which runs on MS-DOS systems, does exactly what I proposed. So far it's only an adjunct to other word processing programs, but I suspect that our UWP will include the "Blue Pencil mode," just as current programs offer spell-checking and outlining.

The Dyson Connection

By the time I asked Esther Dyson what we might expect from the Ultimate Word Processor, I had a pretty good idea of what it might look like: fast as the dickens, containing every feature you could think of, with an interface easy enough to bring Ronald Reagan to computing. Dyson, the computer industry maven who publishes the famed *RELease 1.0* newsletter, blithely suggested this scenario: you wake up in the morning, think about what you have to do that day, brush your teeth, and arrive at the office, and the UWP says, "It's all waiting for you to sign."

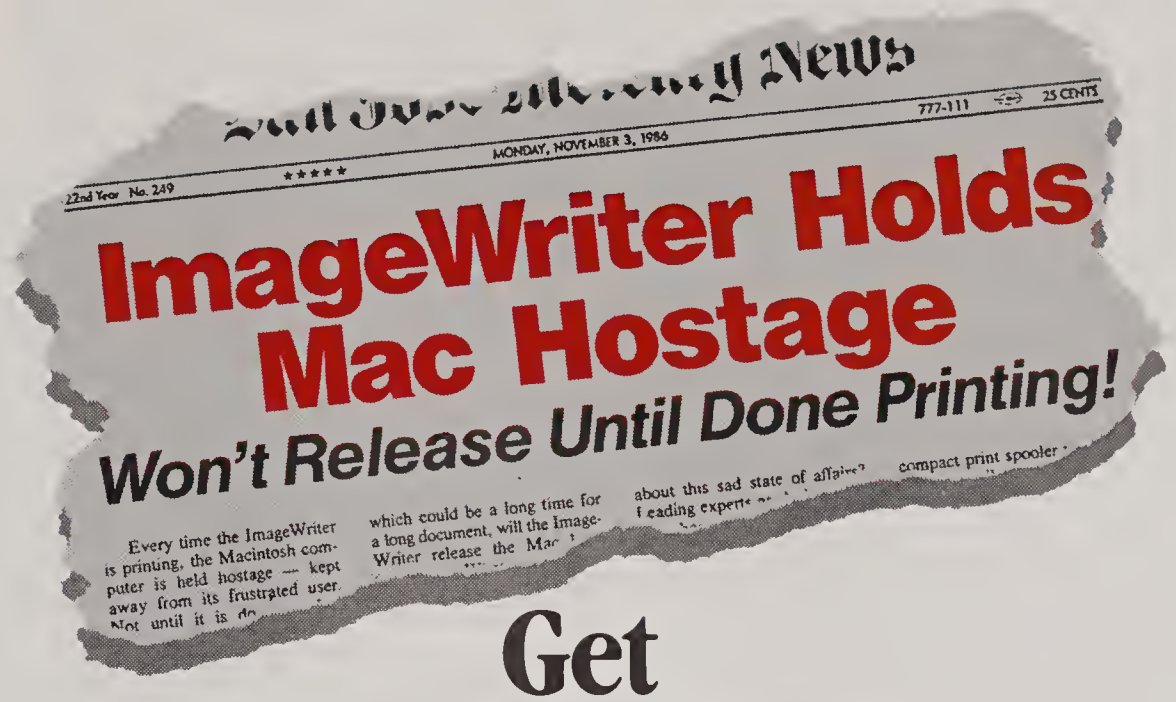
The valet! In the office! With the mouse!

Just kidding, of course. Software can get only so soft. The real point Dyson's making is that the Ultimate Word Processor must take advantage of what will undoubtedly be a world where computers are networked with other computers.

"To me, what would make a word processor interesting is how it integrates outside sources with other things in your text," she says, and lays out an example.

"Suppose I tell the program to type in a letter to John—of course the computer will use voice recognition—and it answers, 'Which John do you mean?,' and I choose

(continues)



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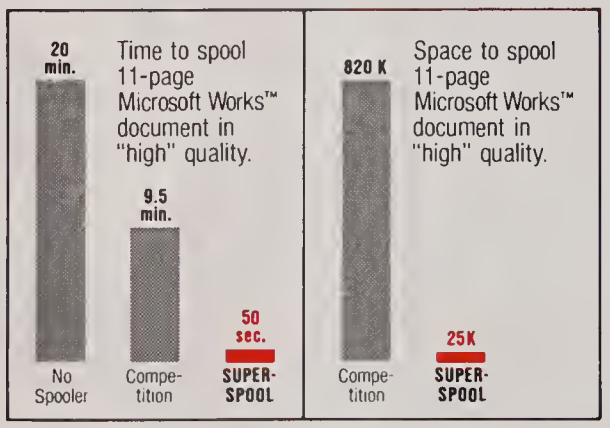
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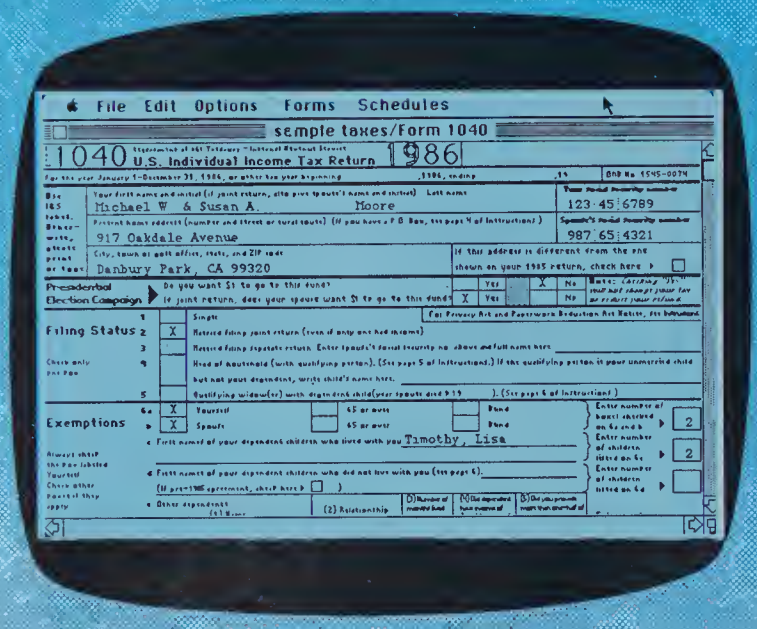


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> **InfoWorld,** *March 3, 1986*

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> **Jerry Pournelle,** *Columnist,* **Byte,** *August, 1986*

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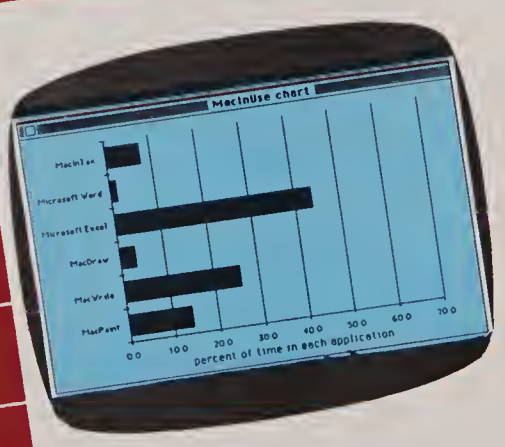
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Steven Levy

John Smith from a list of all the Johns I know. The letter form is already set up according to my preference. In reverse video, I see my last letter to John, maybe his last letter to me, and also some personal information I have on file about John: his birthday, and even the information from my calendar when I last saw him. So I write, 'Gee it was fun seeing you on that boat ride . . . '"

Esther Dyson wonders if the Ultimate Word Processor might eventually be integrated with information outside the machine, woven into a convoluted web of electronic mail and databases. In this vision it would be difficult to tell where your word processor ends and the information network begins. "We've gone pretty far in word processing, but in communications there's a lot to do," she says.

Enjoying the Penultimate

If I got anything out of my ruminations and consultations, it was the reassurance that even though word processing will get easier, we already have it pretty good. I doubt that in five or ten years people will look back at the mid-eighties and pity us for having to put up with our wimpy word processing systems. We can complain about a missing feature here and there (why no transpose-letter or transpose-word function?), but overall, the *Word* 3.0 generation has nothing to be ashamed of.

Personally, I see all those blue-sky wonders in the features-from-the-future category as window dressing, when I consider the real purpose of a word processor: freedom to express ourselves without worrying about the mechanics of writing. Even the vaunted valet that promises to arrive with "softer software" doesn't set my heart racing with anticipation. After all, if I were to stop writing now and ask Jeeves, or whatever his name is, how I should end this column, I bet I know just what he'd say.

"How about something to the effect that even the Ultimate Word Processor can't actually write for you? That computers will never replace columnists, and that's a good thing?"

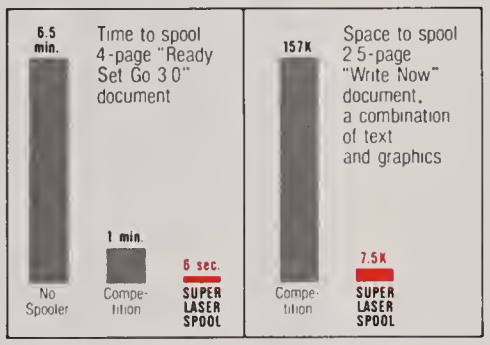
Sorry, Jeeves. My readers would never forgive a thumb-sucker ending like that. I'll just have to tinker around, stare at the screen, delete some bad tries, key in some better ones, and keep *thinking*—until I get it right. □



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This is how it sort of looked as the "Minnow," piloted by racing newcomer James Stephens of Moss Beach, surged ahead to win the recent Half Moon Bay to Snug Harbor Regatta.

Stephens Victorious in Inaugural Yacht Race

In a race filled with risky manuevers and even riskier weather, James Stephens, captain of the 12-meter sloop "Minnow", and his crack 7-man crew conquered 20' swells and a field of 33 contenders to win the first ever Half Moon Bay to Snug Harbor Yacht Race.

A modest Stephens credited his crew for the hard-fought victory, praising their stamina and undying drive to win. "I'd have to say, if it wasn't for the courage of my fearless crew, the Minnow would have lost," Stephens joked

Continued on page 4

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Pictured here is the "Minnow," piloted by racing newcomer James Stephens of Moss Beach, surging ahead to win the Half Moon Bay to Snug Harbor Regatta. (Photo by George Chadwick)

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Continued on page 4

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-Erfert Nielson, December 1986

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Verbatim

An interview with Andy Hertzfeld



As a software wizard on the Macintosh team at Apple Computer, Andy Hertzfeld wrote about a third of the Mac's system software, including the User Interface Toolbox. He also designed software for the ThunderScan digitizer and wrote Switcher, *the utility that allows users to go directly from one application to another, bypassing the Finder.*

Hertzfeld first encountered computers during his high-school years in a Philadelphia suburb, and he continued computing while studying at Brown University. But it wasn't until working on a degree in computer science at the University of California that he turned to professional programming. "I bought my first Apple in 1978, and I immediately lost interest in grad school and started doing products for the Apple II," he says.

In the summer of 1979 he signed on at Apple for a tour of duty that lasted until 1984. In 1980 he produced the firmware for the first 80-column card for the Apple II, an advance he likens to his latest achievement, the software for the Radius Full Page Display, because of the boost in credibility and business utility it gave to the machine.

How do you like working with Radius?

Actually, I'm not an employee of Radius. I'm a friend of the company, a stockholder, and a co-developer of their first product. But there isn't enough software work there to keep me busy full-time, and I need the freedom to continue working on my own projects. I've really enjoyed it so far. It's very exciting to see a new company spring up. Microcomputers are a precarious business: it is tough to start a new company, but at the same time it's a blast.

I wrote all the software for the Radius Full Page Display; actually it's firmware that's incorporated into 32K of ROM. Originally, I didn't think a large screen would need very much software: I thought I could write what was needed in an afternoon. Over time, Burrell and I came up with a lot of neat things that we could do for a large display, and it took a great deal more time to implement than I originally intended.

The single thing I like best in my work is when a person first sees what I've done and says, "Wow!" The Radius FPD is that kind of product; it has a big wow factor. I really enjoy that.

Will Radius become like AST or QuadRam?

I hope not. What's exciting about Radius isn't the opportunity to build niche products to satisfy a market need and make some bucks. Doing what other companies can't do—because they lack the technical skill or imagination—that's what we do at Radius. We want to be pioneers. All of the folks involved with Radius sort of grew up at Apple, so naturally we want to be like Apple. Not in the sense of being a large company but in the sense of creativity and innovation.

Who else at Radius is from Apple?

Well, there's Burrell Smith, who designed the digital hardware of the Macintosh and the LaserWriter (who's also my next-door neighbor and good friend). The president of the company is Mike Boich, one of the original Mac marketing people and Apple's first software evangelist; he's also the coauthor of *MacTerminal*. Matt Carter is the vice president of manufacturing. He was the architect of the Mac factory before he left Apple in mid-1983. Finally, Alain Rossman, who was a key Mac software evangelist, heads up sales and marketing.

What's next at Radius?

They'd kill me if I talked about it. There's this myth in the industry that you have to keep everything about your new products secret. In fact, there is really a double standard: you have to tell investors and third-party developers about your plans, so everything always leaks out anyway. I mean that's part of what Radius is all about—we want to do the things that other companies can't do, so what's the difference if people find out about it? However, I have to respect the judgment of others, so it's not my place to talk about Radius's future products. I can say anything I want to about my own work. I guess I can say that Radius wants to take advantage of new technology as it becomes available and affordable, both from Apple and the chip companies. We also want to address the current limitations of the Macintosh.

What are your impressions of the work going on at NeXT?

Well, I just had dinner with Steve Jobs and a bunch of NeXT guys last night. They haven't shown me the computer yet, but I

(continues)

have a pretty good idea of what they are up to. Part of me really wants to work for NeXT. They have some smart people there, and Steve knows how to get everyone excited about what they are doing. It's going to be tough, but I think they can make it. I'm sure their computer will be great. They're in a different market than the commercial one that Apple is in; at least in education they have a chance to set a new standard. It would be a sad world if a new computer company didn't have a chance to succeed.

How can any computer company make a unique product? The NeXT products will have 68020 CPUs, and the ones after that will have 68030s. Most of the decision making is done by the chip manufacturers; how can a small company compete?

To a degree I think that's true. But the name of the game is software. Motorola and the other major chip manufacturers get to make most of the fundamental decisions, but how the chips are put together can give one company a performance advantage of only 3 times or so. However, if you come up with a great new algorithm, software can give a performance edge of 100 times or more. Also, software can make the computer much more accessible to potential users and can break through to new areas of functionality where there isn't any competition yet. That's why a small company has a chance.

You need really good chemistry in a design group to ensure a good software product. I'm not very impressed with what's currently available. NeXT's computer will compete with Suns and Apollos. Look at the window manager on the Sun or other UNIX systems; it's really pretty bad. It presents NeXT with an opportunity to do much better.

Why won't you move to NeXT?

It's very important to me that my work reach the largest possible audience. Even if NeXT is very successful, they won't sell as many computers in a year as Apple sells in a single month. I also like to be in control of my work; Steve sometimes jerks you around a lot. But I would get a kick out of working with a group again, so who knows?

What excites you the most?

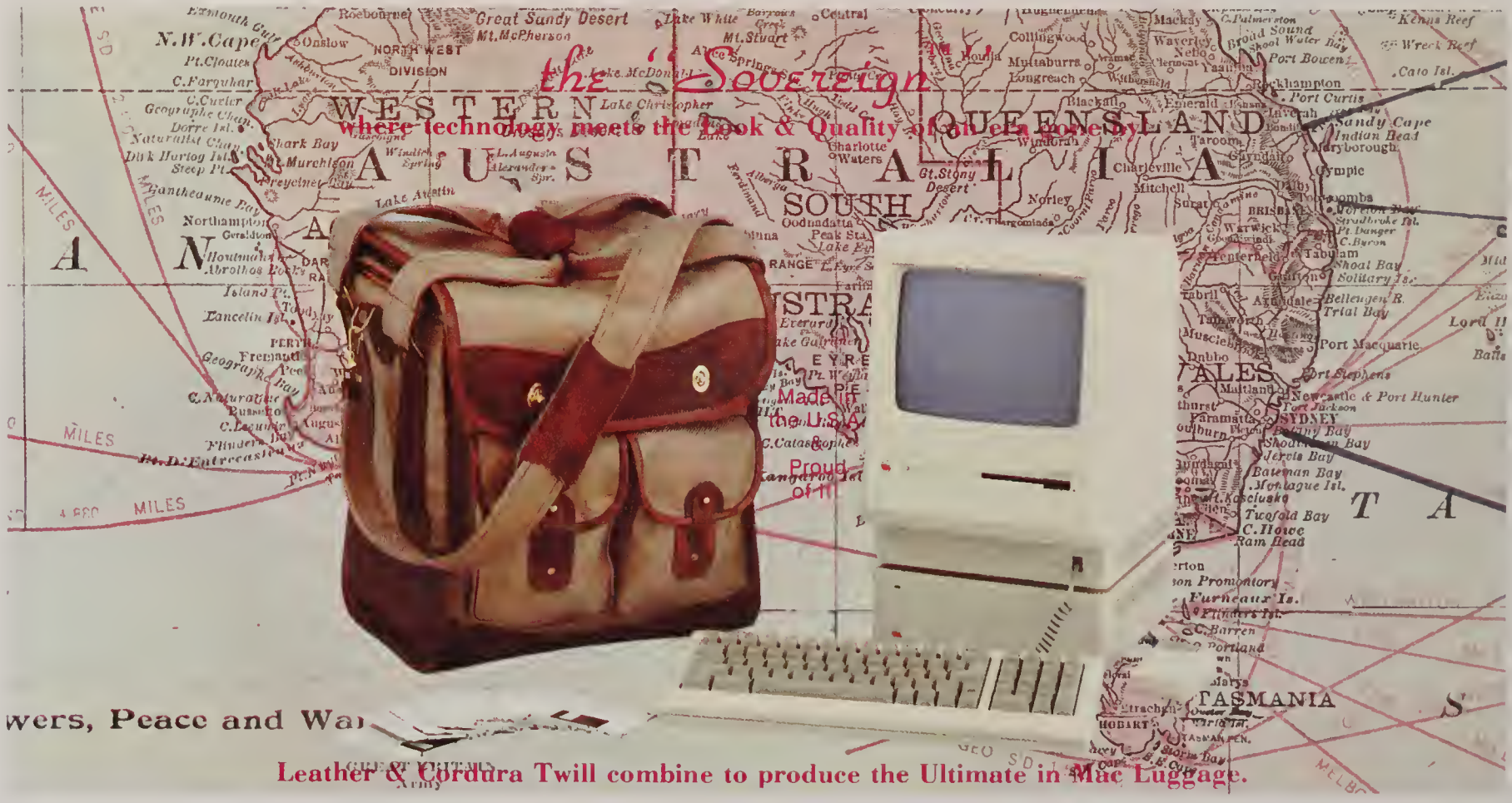
I'd have to say it's the opportunity to reach lots of people with my products. To get me to work for a company, the project would have to be very special, far beyond the scope of what I could accomplish on my own. Why should I work for a company on something like a single application when I could do the same thing on my own? I am constantly reevaluating what I should work on: does it have a lot of utility, will it reach enough people?

Does the Open Mac excite you?

Yeah, but I'm not working on it yet. I'm afraid it's going to be a little too expensive for me to get very excited about it. Part of me is still a 14-year-old kid who wants a great computer but can't afford very much. I want to work on products that kids have a chance to use.

I have to start choosing my projects a little more carefully. I made a mistake with *Servant,* because it competes with what Apple has to do for itself. But there is very little time in life. You have to choose a path

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and walk down it, hoping that you've made the right choice. Sometimes, like with the Mac, you just know that you are working on the right stuff. Other times it's not so clear.

What do you think about John Sculley's work at Apple?

Apple is doing very well right now, so I'd have to say he's doing a pretty good job. My emotions about Apple are quite complicated. Sometimes I'm frustrated by the company because it's so large that it has trouble making decisions. Sculley himself is very bright and focused, but he's conservative in comparison to Steve. They're very different: Sculley is a classic corporate type, while Steve is the opposite of how you learn to be in business school. If I had to make a choice, I'd always take Jobs over Sculley since I'm a romantic at heart. But they didn't ask me; from most people's perspective, Apple is probably better off with Sculley.

How is Jean-Louis Gassée doing with product development?

I don't really keep up with everything that's going on at Apple, so it's hard for me to say. I do know that they are doing the obvious, common-sense kind of things, putting one foot ahead of the other and getting things done. But Gassée can sometimes be a little too much for me. Sometime's he's a little too interested in being liked for what he is doing and not in making the difficult decisions.

There is some debate over the future of PostScript at Apple. What do you think?

PostScript is an excellent page-description standard. There is little reason for Apple to switch from PostScript, and I don't think it will. All of the performance problems that people complain about can and will be solved. I was initially a little biased against PostScript, mainly because I wasn't consulted when they made the choice. But it's well thought out, and I've come to respect it very much.

I do have some mixed feelings; I'm basically a screen guy. The developers of PostScript are focused on printing, which is different from screen graphics because the pages last forever. On a screen, everything is repainted every 16 milliseconds. When you have to go to paper, a lot more care is required to get everything right. There is also a sort of impedance mismatch with QuickDraw that still needs to be smoothed out; for example, regions don't work with the LaserWriter.

Do you think QuickDraw will be able to evolve into a standard for graphics in the Apple community—much as the virtual device interface and others are doing in the IBM world?

QuickDraw already is the standard for graphics in the Apple community, and it's a much stronger standard than anything in the IBM world. QuickDraw must continue to evolve and become more sophisticated as computers become more powerful, but that's true of every piece of software. The most interesting problem is that QuickDraw is still resolution dependent. It's interesting because resolution independence slows things down considerably, and a screen package is worthless if it's not fast enough. My best guess is that future Apple systems will provide QuickDraw and PostScript for both screens and printers; the developers will choose what is most appropriate for them.

What are your perceptions about the tensions between Apple and Microsoft as a result of Microsoft's work with *Windows* for the IBM machines?

If I were Microsoft, I'd probably be doing the same thing. Of course there is some tension. There always has been and probably always will be. They are different companies with different needs and goals. So far they've always been able to work out a mutually beneficial compromise.

What about questions relating to software's look and feel in light of the recent federal court decision that the look and feel of software is protected by copyright?

Windows doesn't really have the look and feel of the Mac. It was influenced by it, but it's certainly not a copy. The decision you mentioned was about nearly identical products. I'm against copyright as a legal

(continues)

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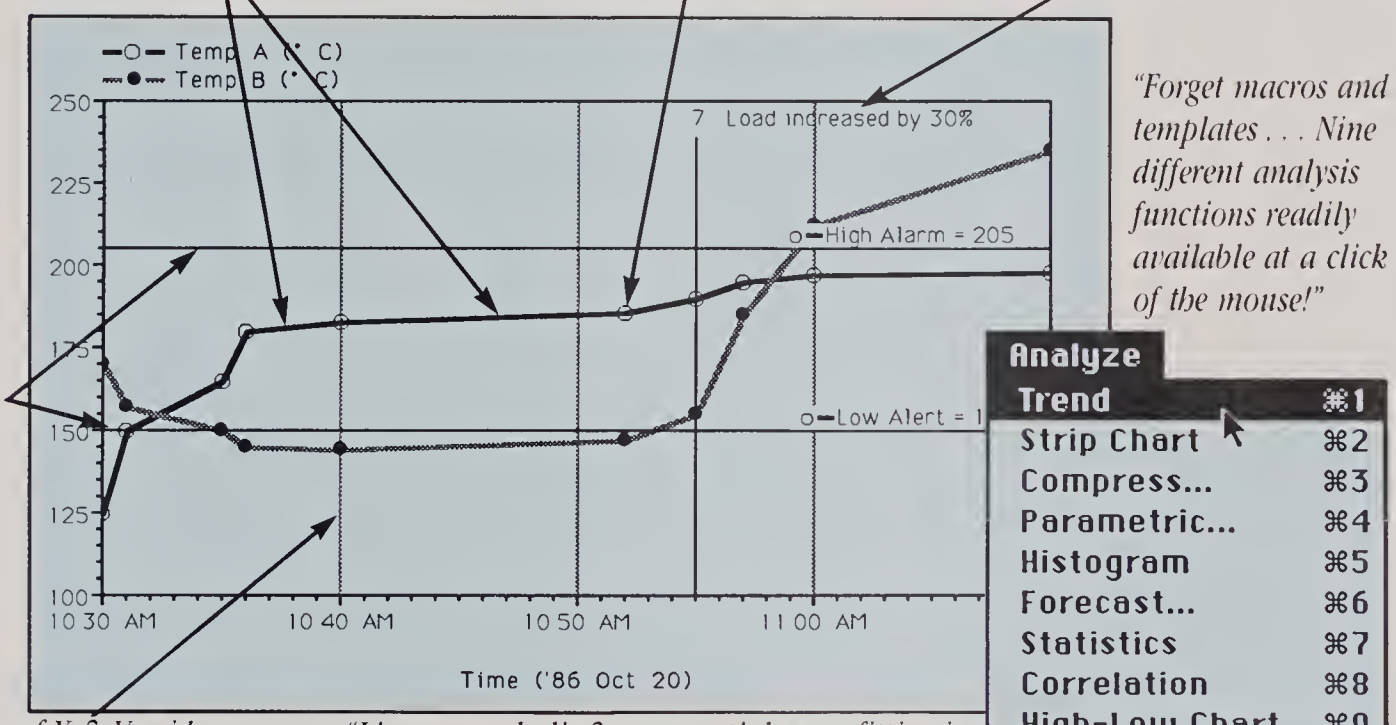
Add your own "Event Markers" to plots

"PM Database . . . Flexible (Allows numbers, graphics, and text) . . . Extensive (Tracks decimals, integers, times, dates, currency, percentages, text, Boolean variables, etc.)"

"Plot Parameter Condition Limits or Reference Values directly on the graph"

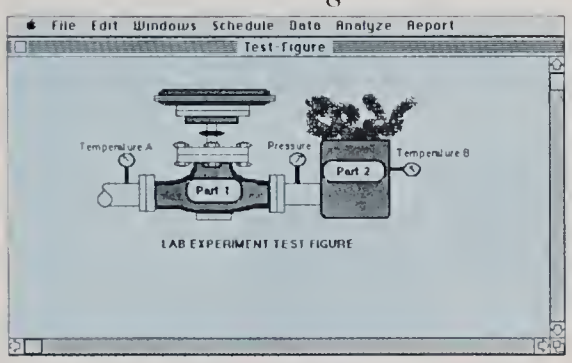
"Select either auto-scaling or fixed scales for both X and Y axes"

"Forget macros and templates . . . Nine different analysis functions readily available at a click of the mouse!"

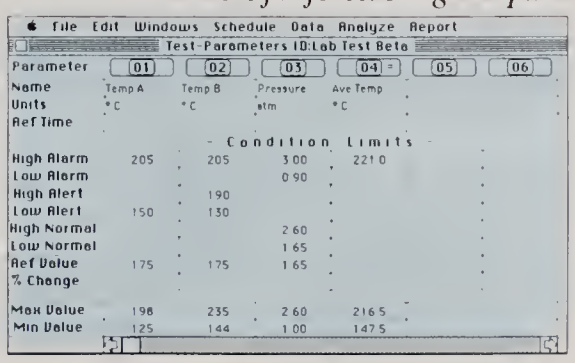


"Offers choice of X & Y grids vs. no grids"

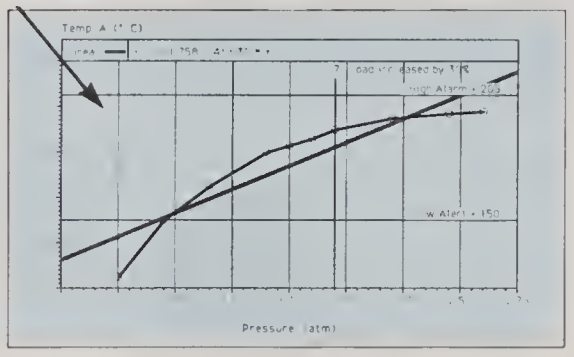
"Linear, parabolic & exponential curve fitting is available for forecasting and parametric studies"



Save your figures & text in PM database



Keep alert to data trends with use of Condition Limits



Compare one parameter to another. Fast.

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Whether you're working in science, engineering, manufacturing, finance, or business, you need to analyze, graph, and chart data. And PM is the one tool you don't want to be without. With power and versatility unmatched anywhere, it sets a new standard for easy-to-use analysis.

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Circle 576 on reader service card

protection for ideas in most cases. I think that code has to be protected, but ideas should not be. The industry achieves progress through competitors refining each other's ideas, and that process should not be stifled. I didn't like Apple threatening to sue Digital Research over *GEM,* even though *GEM* was pretty much a direct knockoff. Stealing ideas and concepts is OK, as long as you put some new ones of your own back into the pool. Just copying a competitor's product isn't very righteous. I think *Windows* is a much more righteous product than *GEM.*

So your code in the Radius machine should be protected?

Yes, I think all code should be protected. But not the ideas that went into the code. It's OK for competitors to copy the Radius two-screen idea as long as they don't copy my implementation. There are a million different ways to achieve the same end result with a completely different implementation. I think that companies and their users are much better off with money being spent on research and development instead of on legal fees.

Does it upset you to see IBM machines running *Windows* or *GEM?*

No, not at all. Seeing IBM computers still running *WordStar* is what upsets me. Seeing windows, a mouse, and better software on an IBM is fine. I feel better for the users, and it makes me feel that we've accomplished that much more.

What's next for graphics on the Mac?

Well, there is a spectrum of things. I suppose the biggest issue is the number of bits per pixel on the screen. The Mac has just 1 bit per pixel, and obviously that's going to change as memory becomes cheaper and processors get more powerful. Eight bits per pixel or even 16 bits per pixel is going to happen fairly soon, for gray scale as well as color. That will really improve the user interface. Screens will look exquisite; you can do incredible things with that much pixel depth.

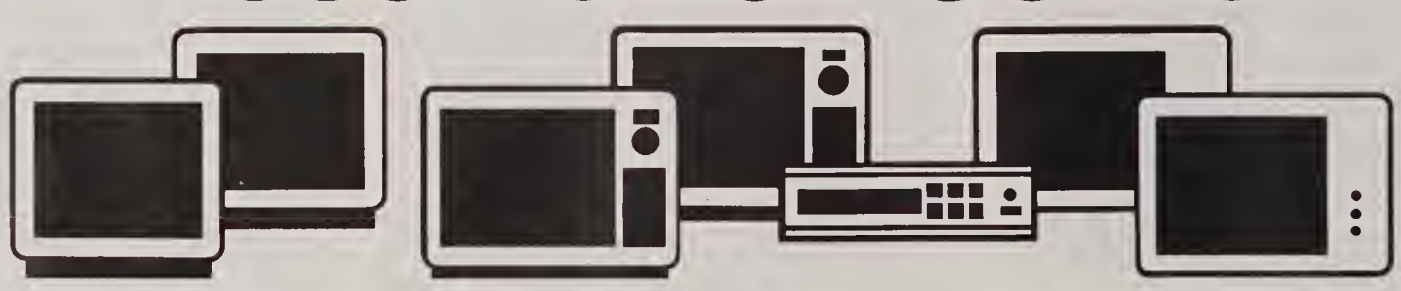
What about graphics coprocessors such as those in other computers?

Many people asked us about that in the original Mac. I think that flexibility is the most important thing. The Macintosh turned out as well as it did because we weren't forced to freeze our ideas in silicon. Bill Atkinson kept improving things constantly as QuickDraw evolved over a period of years. If we had committed to a custom graphics chip he probably wouldn't have invented regions. We're continually learning how to make things better. If you know things are going to change, you have to keep very flexible. It is true that as we move to more bits per pixel, we'll need some kind of hardware assist that much more. But don't forget that the main processors are getting much faster, too.

Of the currently available graphics coprocessors, I think the Texas Instruments 34010 is the best. Burrell was interested in it in 1983 when it was called the IGC. It's completely programmable and extremely flexible. The Intel chip is much more hardwired and limiting.

(continues)

Turn Your Mac Into A Presentation Center



NTSC Compatible Monitor | TV Monitor | VCR (VHS & Beta) | IBM Compatible Monitor

At a surprisingly low cost, the Mac Video Converter enables video data from the Mac or Mac Plus to be simultaneously presented on NTSC or IBM monitors, TVs and VCRs.

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- **Inverse video**
- **Compatibility with all Mac Software**

Display Device	Video Output	Typical number of devices per output*
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TV Monitor**	Composite/ NTSC Video	10 Monitors
VCR** (VHS & Beta)	Composite/ NTSC Video	1 VCR
IBM-RGB Monochrome (Switchable)	IBM Compatible Video	1 Monitor
High Speed Compatible Monitor (22.25 KHZ Horizontal scan rate)	High Speed Composite Video	5 Monitors
Color Monitor (RGB)	RGB Video	1 Monitor

*Maximum number of devices per output is a function of device type and impedance.

**May require use of RF Modulator.

Note: The two Composite/NTSC outputs are identical.

Each output will drive a number of specific display types (please see chart on the left) and will operate simultaneously.

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Direct 1200 Modem

From USRobotics

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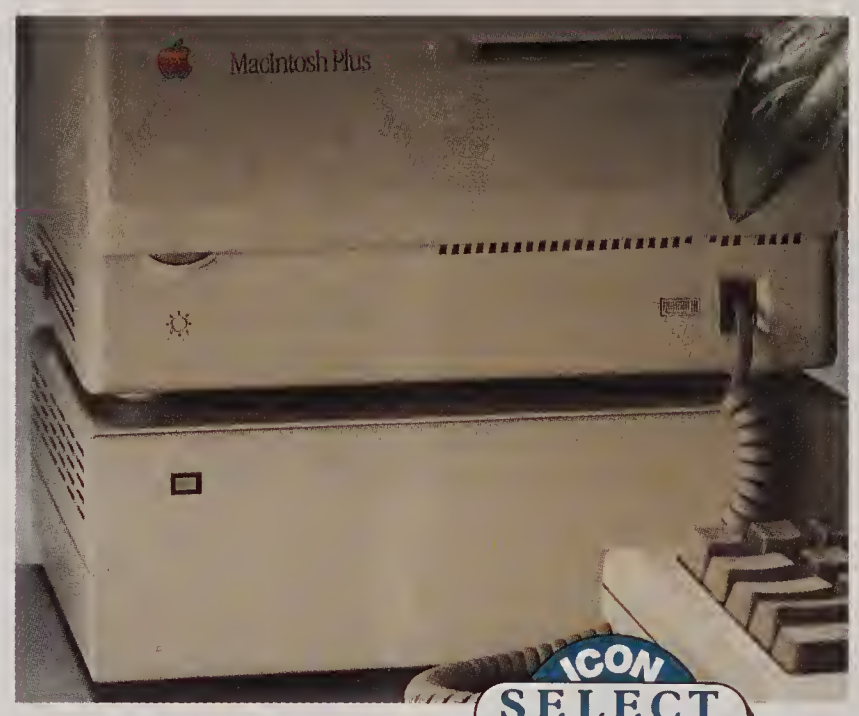
A breakthrough in technology gives you remarkable 1200 bits-per-second (bps) speed at a remarkably low price. If you're still communicating at 300 bps, you'll be amazed at the difference speed makes: files that took you two hours to transfer can be sent in half an hour using the Direct 1200.

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Requires Mac (Plus) cable





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$1049

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Cricket Draw

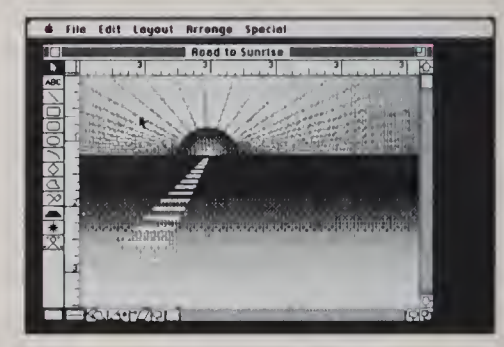
From Cricket Software

$179

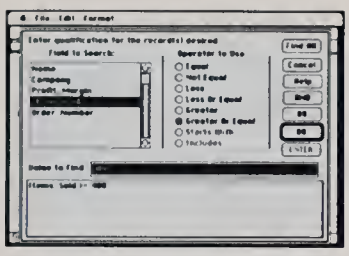
Cricket Draw is a powerful object-oriented drawing program with sophisticated text-editing abilities. Acting as an invisible PostScript editor, it communicates the fine details of your drawing to produce graphics with maximum resolution on a LaserWriter or color graphics on an ImageWriter II.

Use the sophisticated editing abilities to rotate or tilt any object, including text; define shadow depth on text (or any closed object); and mix type styles, fonts, and sizes within one block. Full shape-editing capabilities give you varieties of line width (down to a hairline), 64 possible gray shades, and zoom-in assistance. Order Cricket Draw today for picture-perfect results.

Requires 512K with new ROM or Mac Plus; not copy protected



Icon Review



Reflex

From Borland

$59

Reflex for the Mac combines the analytic capability of a relational database and the number-crunching power of spreadsheet-like formulas in one easy-to-learn and -use database. Link up to 16 databases simply by drawing lines between files on screen; choose display formats and data types when creating free-form layouts; create up to 255 fields per record; and sort on as many fields as desired. Get the most for your money with Reflex.

Requires 512K, Mac Plus, or XL; external drive recommended for 512K

ThunderScan

From Thunderware

This powerful scanner can copy any drawing or photo into your Mac. Easy to install and use, ThunderScan creates documents with high resolution — 200 dpi. The newly enhanced Mac Plus Adapter connects to a disk drive port and has two connectors — one for a disk drive and one for a peripheral like ThunderScan. Easily the most popular digitizer on the market!

Works w/any ImageWriter; Mac Plus users need extra cable to connect w/IW II

ThunderScan
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T'Scan/Mac Plus Adapter
$25
T'Scan/IW II Cable
$18





SuperSpool and Super LaserSpool

From SuperMac Software

No more waiting while your printer chugs away. These RAM-resident print spoolers let you go on to the next important task, while your last job is spooled to disk (where it's safe from system crashes) and printed. A special desk accessory lets you arrange the order your jobs are printed; you can even pause or delete jobs if you like. Don't stop working just because your printer is printing.

Requires 512K or Mac Plus

SuperSpool
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Requires 512K or Mac Plus & 5-meg cartridge; cable included

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DB9 Switch **$29**
Works w/128 or 512K; requires Mac Plus to IW II cable

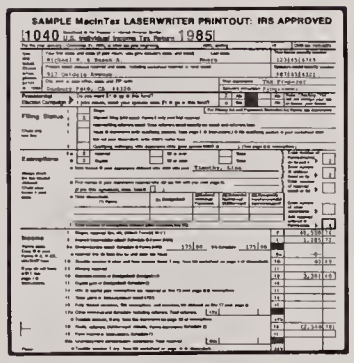
Mini Din 8 Switch **$39**
Works w/Mac Plus; requires Mac Serial DB9 cable



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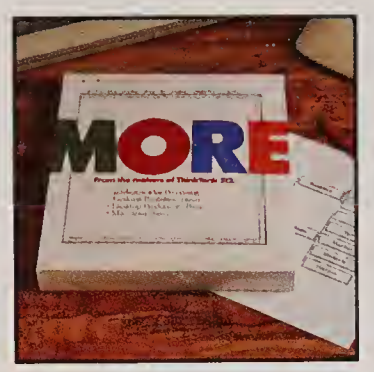
MacInTax's income tax preparation and planning program displays actual IRS forms on the Mac screen; accesses the complete IRS instruction booklet on-line; calculates all entries automatically; and interfaces with accounting programs. Itemize any amount; link



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Requires 512K or Mac Plus & external drive or hard disk

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From Icon Review

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MindWrite works w/512K, Mac Plus & Switcher; FactFinder works w/any Mac



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Enhanced version, requires 512K

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Excel 1.03 *NEW* $225
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Works $179

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MindWrite 1.0 $89
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Odesta
Double Helix *SPECIAL* $279
Helix 2.0 *SPECIAL* $99
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Powerful databases require 512K or Mac Plus

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Ehman 800K External Drive

From Ehman Engineering

$179

This carefully designed external 800K drive is now available at a new low price! And, since it's quieter than the competition you have to look at its light to know it's running. It handles both 400K and 800K disks, has a manual eject option, and works with any Mac. Backed by a manufacturer's one-year warranty, this drive is a great value!

Super Paint

From Silicon Beach

$55

SuperPaint combines the capabilities of MacPaint and MacDraw, *and* adds exciting new features. Use bit-map and object-oriented options in the same drawing, open multiple windows, and enjoy automatic scrolling that allows your pictures to exceed screen size easily. Choose three levels of magnification, 32 shades of LaserWriter gray, and more. This is the paint program you've been waiting for!

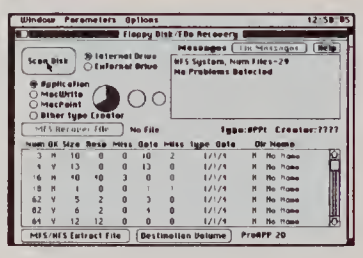
Requires 512K, Mac Plus, or Mac XL



Mac Zap 5.0

From Micro Analyst

$39



If you throw a file away and empty the Trash by mistake, you can call on Mac Zap to retrieve it. Mac Zap is also a superior disk copy and software backup program. It changes code in applications through a sector/track editor, copies master disks, compares disks, analyzes disk structure, and copies protected programs to a hard disk. New version supports HFS hard disk recovery!

Works with any Mac; not copy protected



Bernoulli 20 + 20

From Iomega

$2395

The 20 + 20 Bernoulli Box offers a fast, reliable, and cost-effective mass-storage solution for any office. The unlimited data storage, efficient backup, and maximum flexibility provided by removable data cartridges put Bernoulli Boxes in a class by themselves. (See Disk Drive section below for listing of other Iomega products.) *Requires Mac Plus; cable & SCSI Terminator; 20-meg cartridges*

MagNet 20x

From Mirror Tech.

$849

If you want speed, power, and 20 megs of storage for your Mac Plus, the MagNet 20x is a practical alternative. This rugged external drive is fast, reliable, and compact. MacServe networking software (a $250 value) is included free, giving you a multiuser disk server, print spooling, incremental backup, a disk cache, and much more. Order the MagNet 20x to get the networking power and speed you need to get all your jobs done faster.

Requires Mac Plus



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• Legal Dictionary $53
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MacLink Plus w/cable $159
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PhoneNet for Mac Plus $39
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Hayes
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Smartmodem 2400 *SPECIAL* $629
Smartmodem Bundle $449
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Software Ventures
MicroPhone *SPECIAL* $65

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AST 4000 $4900
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• 20+20 Dual SCSI Drive *SPECIAL* $2395
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• 5 Meg Cartridges (3 Pack) $99
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Mirror 20 Tape Backup $929
Mirror 40/40 $2595

PCPC
MacBottom 20 Meg SCSI $899
MacBottom 20 Meg Serial $899

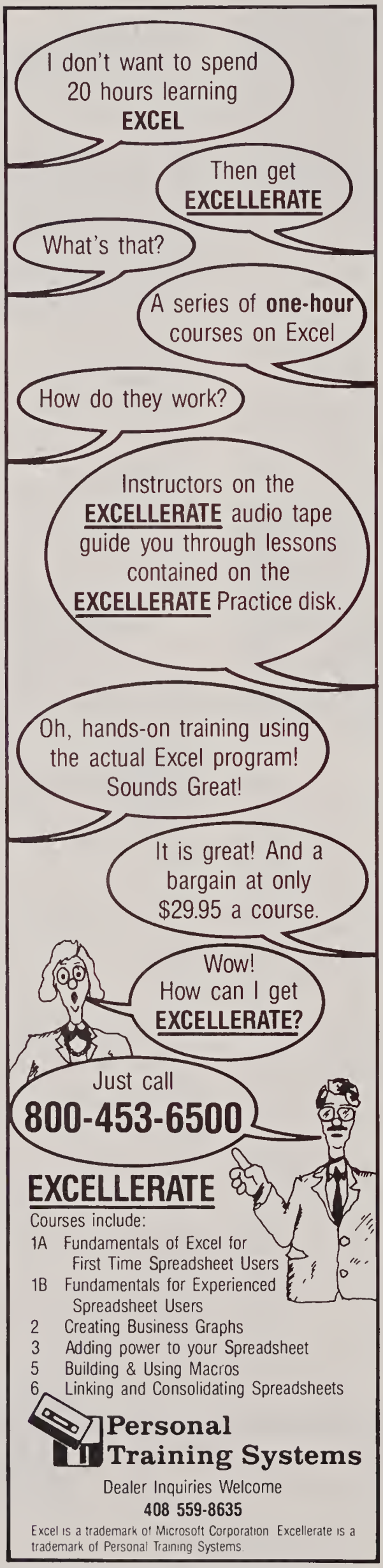
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Verbatim

What about the future of large screens?

Well, I wouldn't have worked on the Radius if I didn't think large screens were important. We prefer the portrait mode configuration over more horizontally oriented screens, because of the way most users work. The reason that other companies have chosen a horizontal orientation has to do with the hardware: everyone is using the same NEC video RAM that naturally supports 1024 pixels per scan line. Burrell and I both try to think of the user's point of view, as opposed to technological efficiency. You want your large screen to complement the Macintosh, not overwhelm it. One of the best things about a Mac is its small size, how it fits easily on a desk. You don't want your screen to be twice the size of the Mac itself. We believe that most Mac users want to be able to see the entire page they are working on, with some room to keep tools and desk accessories. The Radius display achieves that without overwhelming the Mac. We optimized for the highest possible video quality, as opposed to the number of dots.

On the other hand, CAD/CAM and some other applications, such as huge spreadsheets, require a very wide screen, so you would be better off with a competitor's product. We believe that the majority of Mac users are involved in document preparation, and the Radius display is great for that.

How do you look back on your time developing the Macintosh?

It was the best time I've ever had. I was sure that I was spending my time doing something very worthwhile; that's the best feeling there is. I also got to work with some incredibly great people. In fact, I get too much credit these days for the Mac software. Bill Atkinson is much more responsible than I am for the ideas that went into the Macintosh. He is the best programmer I've ever met, and I was very lucky to work with him. There were three others who did crucial work: Larry Kenyon was responsible for the I/O system and eventually the memory manager and file system; Bruce Horn designed the resource manager and the Finder and was responsible for lots of the ideas that went into the system; and Steve Capps came on in 1983 to help Bruce with the Finder as well as to write TextEdit and plug in wherever needed. Steve's a great guy and we couldn't have done it without him.

It's unfortunate that the media singles out a few people and ignores everyone else, but I guess that's the way things have to work. So many people did important work on the Macintosh; it really was a team effort. I know that *Macworld* ran an article on the whole team in its first issue, but that was very unusual. Some rarely mentioned people like Larry Kenyon, Jerome Coonen, the software manager and SANE author, and Donn Denmann, who wrote MacBASIC, put so much into it. MacBASIC didn't even see the light of day.

What happened to it?

It's a long story, but it was eventually flushed down the toilet. Donn didn't finish it on time, but it was politics more than anything else that killed it. Microsoft started with a BASIC interpreter, and a lot of corporate pride is tied up in that area. They convinced Apple that more than one BASIC would confuse things and that Microsoft's was good enough, even though Donn's was considerably better.

Do you have any classic examples of gaffes in development?

Oh, sure, we had our share of them. For a while we had someone working on the memory manager and file system who was in way over her head; she wasn't a very good programmer and managed to screw things up pretty badly before we realized what was happening. It's very important for everyone on the team to be solid. And of course we all had our share of embarrassing bugs, but overall I think we did pretty well.

Are there any products for the Mac that you don't like?

Of course there are, but I don't think I want to name any. I don't want to hurt anyone's feelings. In hardware things are really dull. Currently, three or four categories cover all of the hardware products for the Mac, which is a shame since so much more is possible.

I tend to gravitate toward developing peripheral hardware. I did a lot of peripheral cards for the Apple II in the early days, probably more than anyone else, including the first 80-column card for the Apple II. I really enjoyed working on ThunderScan, which has a very high wow factor. But I'm pretty bored with companies that only

(continues)

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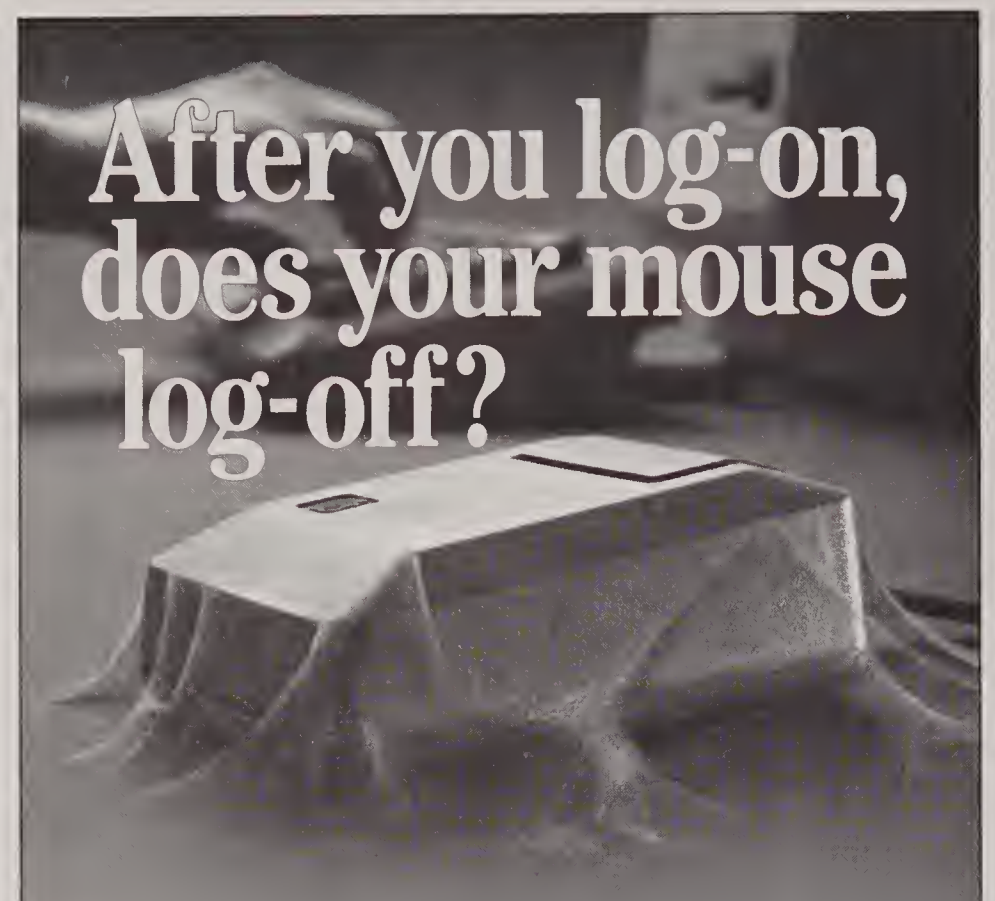
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Circle 622 on reader service card



Probably. Because until recently, telecommunications and mice simply didn't mix. Because mainframes don't know or care about such things as icons and pointing and clicking.

With inTalk, a remarkable communications program from Palantir, mainframe software can be made Mac-like. Built into every copy is a robust programming language named CCL. In addition to its capacity to perform unattended file transfers and the like, you can use CCL to "hide the host," our term for applying the Macintosh user interface to text-based software. For example, the DIALOG statement defines and displays a dialog box. When one of its buttons is clicked, appropriate characters are sent to the host. By testing the characters that come back, you can display another dialog, output text to the printer, send or receive a file, reprogram the function keys–you decide.

With a little effort, your CCL scripts can produce spectacular results. Imagine controlling mainframe accounting software with points and clicks, or traversing the elephantine CompuServe command tree without touching the keyboard.

If you compare, you'll find that inTalk is the most powerful Macintosh communications software money can buy, with more file transfer protocols, more terminal emulations, more function keys, more features, period, than any other Mac com program. No wonder Apple recommends inTalk in its Connectivity Guide as the program of choice for interfacing with mini and mainframe computers.



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*Formerly called inTouch

Circle 387 on reader service card

make hard disks or memory upgrades; that doesn't take much imagination.

In terms of software, there are a lot of really funky databases out there. One of the word processors that recently came out is a disgrace. But I should also say that there are many great programs coming out, too. One of the best I've seen recently is a virtual instrument system called *LabView.*

The program that we covered in our September issue?

Yes. It really captures the spirit of the Macintosh and is a breakthough product in its field. I wish that I had written it. Another really good product is *WriteNow,* the word processor that's marketed by T-Maker. While it's not a breakthrough like *LabView,* it's an excellent consolidation-type product. It brings word processing on the Mac to a new level.

What will you do when you grow up?

I hope I never have to grow up. Eventually I would like to become a fiction writer. I think I'll program through my 30's and then become a novelist. As long as I am excited with what I'm doing, I'll keep on programming. I love programming. I'm very lucky to get paid to do what I enjoy the most. But I'm afraid that I won't be able to do the kind of work I do now in 10 years or so. Systems programming requires intense concentration and an incredible amount of energy, which I'm not sure I'll still have 10 years from now.

Is there any new technology that interests you?

Well, there is Pixar, the graphics company up in Marin. Their stuff is pretty awesome, and I'd like to learn what makes it tick. There is also the Connection Machine, which is being built by Thinking Machines in Cambridge. They are the first people to really shatter the Von Neumann bottleneck. Their machine is what all computers will be like 30 years from now.

What is going on with *Servant?*

Well, we're having this conversation in October. Hopefully, I'll be almost finished with *Servant* by the time this is published. I'm currently working on it every day, try-

(continues)







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Murray Somers, Private Investor

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Microsoft Chart 1.0	72.00
Microsoft Excel 1.03	225.00
Legisoft/Nolo Press WillWriter V2.0 *(Includes Testimonial Trust)*	32.00
Pro Plus Software	
Market Pro *(Portfolio Management System)*	259.00
Satori Software	
Legal Billing *(Time Billing for Attorneys & Accountants)*	389.00
Project Billing *(Full Featured Time Billing Package)*	449.00
Bulk Mailer *(Mail List Management up to 8,600 Names)*	79.00
Bulk Mailer Plus *(Mail List Management up to 90,000 Names)*	229.00

Word/Idea Processors

Apple Computer MacWrite	99.00
Living Videotext More *(Third Generation Idea Processing)*	159.00
Think Tank 512	99.00
Microsoft Microsoft Word 3.0	Call
MindWork Software MindWrite	89.00
OWL International	
Guide *Hypertext for the Macintosh*	95.00
Symmetry Acta *(Outline Word Processor in DA Format)*	39.00
Target Software Voila! *(Full Featured Desk Accessory Outliner)*	53.00
T/Maker Company	
WriteNow *(Dedicated Word Processor w/On-Line Spell Checking)*	105.00

Spelling Checkers

A.L.P. Systems	
MacProof V2.0 *(Spelling, Style, & Grammar Checker)*	129.00
Assimilation Process The Right Word	49.00
Batteries Included Thunder! *(Interactive Spelling Checker)*	26.00
Creighton Development	
MacSpell+ *(Requires 512K)*	55.00
EnterSet, Inc	
MacGas *(with Glossary & Thesaurus)*	55.00
Greene, Johnson Inc.	
Spellswell *(60,000 word Dictionary!)*	45.00
Hayden Software Hayden: Speller	27.00
Lundeen & Associates	
WorksPlus Spell *(Glossary & Spelling Checker for Microsoft Works)*	32.00
Target Software	
MacLightning 2.0 w/Merriam Webster Dictionary	53.00
Additional Thesaurus Library	29.00
Medical Dictionary or Legal Dictionary	53.00

Desktop Publishing

Boston Software Publishers	
The MacPublisher II	139.00
Mac-Hy-Phen	69.00
MacIndexer	62.00
Manhattan Graphics	
Ready, Set, Go! *(Version 3.0)*	169.00
Ready, Set, Go! Desk Design	37.00
Orange Micro, Inc.	
Ragtime *(Integrated Page Processing)*	239.00
Solutions, Inc.	
Glue *(Transfer Graphics Conveniently and "Print to Disk" Facility)*	35.00

Accounting Packages

BPI	
BPI Entry Series-General Accounting	225.00
Chang Labs	
Rags to Riches GL, AR, or AP	125.00
Rags to Riches Three Pack-GL/AR/AP	299.00
Inventory Control	245.00
Professional Billing	245.00
Professional Three Pack-GL/Professional Billing/Payables	349.00
Continental/Arrays	
The Home Accountant	89.00
Digital, Etc. *Turbo* Maccountant	289.00
Monogram Dollars & $ense	81.00
Open Systems	
Open For Business II	499.00
Palantir	
GL, AR, or Inventory Control *(each)*	59.00
Peachtree	
Back To Basics GL, AP, or AR *(each)*	89.00
Sierra On-Line	
MacOneWrite CD, AR, or GL *(each)*	39.00
MacOneWrite Three Pack *(GL/AR/CD)*	59.00

Statistics Packages

BrainPower StatView 512 Plus	179.00
Cricket Software Statworks	79.00
StatSoft StatFast-2	75.00
Statware, Inc.	
Stat80 *(Professional)*	279.00
Systat Systat *(Version 3.0)*	459.00

Graphics Software

Altsys Corp. FONTastic	27.00
Ann Arbor Softworks	
Full Paint *(Un-Protected, includes ColorPrint)*	55.00
Apple Computer MacPaint	99.00
Broderbund Print Shop	49.00
Toy Shop	41.00
Casady Company	
Fluent Fonts *(Two-Disk Set)*	29.00
Fluent Laser Fonts *Choice of: Bodoni, SanSerif, Ritz & Right Bank, Monterey, Caligraphy & Regency, or Prelude*	49.00
Dubl-Click Software	
World Class Fonts Volume I *(Three Disk Set)*	29.00
World Class Fonts Volume II *(Three Disk Set)*	29.00
Hayden VideoWorks	59.00
DaVinci: Building Blocks	52.00
DaVinci: Commercial Interiors	119.00
Innovative Data Design	
Paste-Ease *(Volumes I & II)*	35.00
i/O Designs	
ColorPrint Software Only	25.00
ColorPrint Starter Kit-3	39.00
MicroSpot MacPalette	52.00
Miles Computing	
Mac The Knife Volume III or Volume IV	27.00
Mindscape ComicWorks	49.00
GraphicWorks	49.00
Silicon Beach Software	
SuperPaint *(Advanced Graphics Tool for The Macintosh)*	56.00
Silicon Press *(Color Printing Tool for Labels)*	42.00
Symmetry PictureBase	45.00
T/Maker	
Click Art Letters or Personal Graphics	29.00
Click Art Publications or Effects	29.00
Click Art Letters II or Click Art Holidays	29.00
Click Art Business Image	29.00

CAD Products

Apple Computer MacDraw	159.00
BrainPower DesignScope	129.00
Challenger Software	
Mac 3D *(Version 2.0)*	149.00
Cricket Software Cricket Draw	179.00
Dreams Of The Phoenix	
Phoenix 3D Level One	27.00
Enabling Technologies Easy 3D	69.00
Professional 3D	199.00
Innovative Data Design	
MacDraft *(Version 1.2)*	179.00
MicroSpot MacPlot	119.00
MacPlot Professional	234.00

Educational/Creative Software

Addison Wesley Puppy Love	14.00
Broderbund Sensei Geometry	65.00
Davidson & Associates	
Speed Reader II	37.00
Math Blaster or Word Attack!	27.00
Electronic Arts	
Pinball Construction Set	27.00
Deluxe Music Construction Set V2.0	64.00
First Byte	
Kid Talk, Speller Bee, or Math Talk	42.00
First Shapes	32.00
Great Wave Software	
ConcertWare Plus	32.00
Concertware MIDI	89.00
KidsTime	29.00
Hayden MusicWorks	32.00
Score Improvement System for the SAT	59.00
Score Improvement-Achievement Tests	59.00
Kette Group Studio Session	69.00
Micro: Maps	
MacAtlas U.S.A. or MacAtlas World	49.00
Microsoft Hands On Excel	32.00
Learning Multiplan & Chart	39.00
Mindscape	
Perfect Score SAT w/The Perfect College	47.00
The Lucher Profile	24.00
Dick Francis' High Stakes	26.00
Rubicon Publishing	
Dinner at Eight	35.00
Silver Palate Collection	29.00
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Concepts Computerized Atlas	39.00
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Game Software

Accolade Hard Ball	25.00
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Microsoft	
Flight Simulator *(Version 1.0)*	32.00
Mindscape Balance of Power	30.00
Deja Vu: A Nightmare Comes True	33.00
Indiana Jones: Revenge of the Ancients	25.00
James Bond 007: A View To Kill	24.00
James Bond 007: Goldfinger	24.00
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Racter	27.00
The Uninvited	30.00
Omnitrend Software	
Omnitrend's Universe II	39.00
Origin Systems Exodus: Ultima III	38.00
PBI Software	
Strategic Conquest Plus *(Multi-Player War Game)*	39.00
Polarware Transylvania, Sword of Kadash, or The Quest	15.00
Xyphus or The Crimson Crown	15.00
Practical Computer Applications	
MacGolf *(Version 2.0)*	36.00
Psion	
Psion Chess *(3D & Multi-Lingual)*	31.00
Q Ware, Inc. OrbQuest	35.00
Silicon Beach Software	
Enchanted Scepters	21.00
Dark Castle	28.00
World Builder	42.00
Simon & Schuster	
Star Trek *(The Kobayashi Adventure)*	24.00
Sir-Tech Mac Wizardry	36.00
Spectrum Holobyte GATO	26.00
Orbiter	27.00
Sublogic	
JET *(Simulates Land Based F-16 & Carrier Based F-18)*	35.00

Disk Drives/Hard Disks/ Upgrades

AST Research	
AST-2000 *20 MB External Hard Disk with 20-MB Cartridge-Tape Backup for the Macintosh Plus.*	1995.00
AST-4000 *74 MB External Hard Disk with 60-MB Cartridge-Tape Backup for the Macintosh Plus.*	4735.00

In Connecticut Call (203) 378-3662

Dove Computer Corporation	
MacSnap Model 524 *(512K to 1MB Upgrade)*	139.00
MacSnap Model 548 *(512K to 2MB Upgrade)*	389.00
MacSnap Plus 2 *(MacPlus to 2MB Upgrade)*	259.00
MacSnap Plus 2H *(MacPlus to 2MB Upgrade w/1MB Chips)*	799.00
MacSnap Plus 4H *(MacPlus to 4MB Upgrade w/1MB Chips)*	1599.00
Ehman Engineering	
All Ehman Drives come with a 12-Month Warranty	
800K Disk Drive *(Totally Silent Operation)*	219.00
20HD *(20MB SCSI Hard Drive for MacPlus)*	Call
Iomega	
Single Cartridge Drives	
Bernoulli Box 10MB for MacPlus	1209.00
Bernoulli Box 20MB for MacPlus	1619.00
Dual Cartridge Drives	
Bernoulli Box 2-10MB for MacPlus SCSI	1819.00
Bernoulli Box 2-20MB for MacPlus SCSI	2359.00
10MB Cartridges *(3 Pack)*	159.00
20MB Cartridges *(3 Pack)*	209.00
Head Cleaning Kit	69.00
LoDOWN	
Hard Disks & Tape Backups for the MacPlus	
LoDown 20/20 Combo *(20 MB Hard Disk w/20MB Tape)*	1439.00
LoDown-T20 *(20 Megabyte Tape Drive)*	789.00
LoDown-20 *(20 Megabyte Hard Disk)*	889.00
MacMemory, Inc.	
MaxPlus *(2MB Upgrade w/MaxRam/MaxPrint/MaxChill)*	265.00
MaxPlus Enhanced *(2.5MB w/MaxRam/MaxPrint/MaxChill)*	489.00
MaxSave *(Internal Recoverable Ram Disk For the MacPlus)*	79.00
MaxPack *(MaxPlus and MaxSave Bundle)*	339.00
MDIdeas, Inc.	
HD-20 *(20MB Hard Disk For MacPlus)*	859.00
HD-30 *(30MB Hard Disk For MacPlus)*	1199.00
TDBK-20+ *(22MB Cartridge Tape Backup)*	859.00
Mirror Technologies	
Magnum 800K External Drive	229.00
MagNet 20X *(External 20MB Hard Drive w/Cable)*	779.00
MagNet 30X *(External 30MB Hard Drive w/Cable)*	949.00
MagNet 30X *(External 30MB w/MacServe & Cable)*	995.00
MagNet 40/40 *(40MB w/40MB Tape, MacServe Included)*	2595.00
MagNet 85X *(74MB w/40MB Tape, MacServe & Cable)*	4495.00
Magnum Tape 20 *(20MB Tape Backup)*	929.00
FastPort *("SCSI" Port for your Mac 512K)*	139.00
Peripheral Land	
PL 20-21MB Formatted for MacPlus	789.00
PL 30-32MB Formatted for MacPlus	979.00
MacFast 20-21MB w/Tape Controller for Mac 512K or MacPlus	979.00
MacFast 30-32MB w/Tape Controller for Mac 512K or MacPlus	1259.00
MacBack 20-27MB Tape Backup	799.00
MacPort Plus Host Adaptor-SCSI Interface for Mac 512K	159.00
Personal Computer Peripherals	
MacBottom HD-21 *(20MB Hard Disk for MacPlus SCSI)*	869.00
PKI	
McD 800K External Drive	189.00
ProAPP	
World's Fastest High-Capacity MacPlus SCSI Hard Disk System:	
ProAPP 40S Hard Disk System *(Sub-30msec. Voice Coil Technology)*	Call
ProAPP 20MB Hard Disk System *(Mac 128K,512K,MacPlus SCSI)*	Call
Western Automation Labs	
Dasch External RAMdisk *(2048KB)*	399.00
Western Computer	
Big Mac Twin Pack *(20MB Hard Disk w/20MB Tape Backup)*	1599.00

Modems

Anchor Automation	
Signalman Express 1200 Baud	235.00
Signalman Lightning 2400 Baud	355.00
Hayes Microcomputing	
Interbridge	549.00
Smartmodem 1200	379.00
Smartmodem 1200 Mac w/Smartcom II & Cable	429.00
Smartmodem 2400	579.00
Transet 1000-128K	269.00
Transet 1000-512K	359.00
Transet 1000 Mac Accessory Kit	31.00
Prentice	
Popcom X-100 Modem w/Straightalk	259.00
Prometheus	
Promodem 1200M w/ProCom-M	299.00
U.S. Robotics	
Password 1200	199.00
Courier 2400	389.00

Printers

Brother	
M-1109AP *ImageWriter Compatible*	269.00
HR-20 *(20cps)* Daisywheel/Serial	349.00
HR-35 *(35cps)* Daisywheel/Serial	729.00
Juki	
6100 *(18cps)* Daisywheel Serial	399.00
6200 *(30cps)* Daisywheel Serial	579.00
6300 *(40cps)* Daisywheel Serial	689.00
Okidata	
ML-192 Apple Mac/Lisa	389.00
ML-193 Apple Mac/Lisa	559.00
Toshiba	
P-321 24 Pin *(216cps)* Par./Ser. 10"	499.00
P-341 24 Pin *(216cps)* Par./Ser. 10"	739.00
P-351 24 Pin *(288cps)* Par./Ser. 15"	1079.00

Blank Media

Single Sided 3½" Diskettes	
BASF 3½" SS/DD Disks *(box of 5)*	9.00
Bulk *(Sony)* 3½" SS/DD Disks *(10)*	15.00
Sony 3½" SS/DD Disks *(box of 10)*	16.00
Centech 3½" SS/DD Color Disks *(box of 10)*	18.00
Fuji 3½" SS/DD Disks *(box of 10)*	16.00
Maxell 3½" SS/DD Disks *(box of 10)*	16.00
Verbatim 3½" SS/DD Disks *(box of 10)*	17.00
3M 3½" SS/DD Disks *(box of 10)*	19.00
C.Itoh Color Disks SS/DD *(box of 10)*	21.00
Double Sided 3½" Diskettes	
BASF 3½" DS/DD Disks *(box of 5)*	14.00
Bulk *(Sony)* 3½" DS/DD *(10)*	21.00
Centech 3½" DS/DD Color Disks *(box of 10)*	24.00
Sony 3½" DS/DD Disks *(box of 10)*	24.00
Fuji 3½" DS/DD Disks *(box of 10)*	24.00
Maxell 3½" DS/DD Disks *(box of 10)*	24.00
Verbatim 3½" DS/DD Disks *(box of 10)*	25.00
3M 3½" DS/DD Disks *(box of 10)*	27.00
C.Itoh Color Disks DS/DD *(box of 10)*	29.00

Digitizers

Kette Group	
Capture any sound from the real world!	
MacNifty Audio Digitizer w/SoundCap	99.00
Koala Technologies Corp.	
KAT Graphics Tablet	139.00
MacVision	175.00
Magnum	
Natural Sound Cable & Editor	89.00
Sound Effects	26.00
New Image Technology	
Magic Digitizer	249.00
Summagraphics	
MacTablet 6x9 size	289.00
MacTablet 12x12 size	379.00
ThunderWare	
Thunderscan V3.2 *(Mac 128, 512K, & MacPlus)*	175.00
Power Port *(Required to use Thunderscan on a MacPlus)*	29.00
Power Port to ImageWriter II Cable	19.00

Accessories

A.M. Products	
3½" Head & Computer Cleaning Kit	18.00
Assimilation Process	
Numeric Turbo	119.00
Mac Turbo Touch	89.00
Bech-Tech	
Fanny Mac	79.00
Curtis Manufacturing	
Diamond-Surge Suppressor-SP1	29.00
Emerald-Surge Suppressor-SP2	36.00
Ruby-Surge Suppressor-SPF-2	55.00
Sapphire-Surge Suppressor-SPF-1	47.00
Environmental Software Company	
MacAttire: Available in Navy-Blue, Burgundy, or Silver-Gray.	
External Drive or Keypad Cover	7.00
ImageWriter II Cover	11.00
Wide ImageWriter Cover	13.00
Mac & KeyBoard Cover	15.00
MacPlus & Keyboard Cover	15.00
MacPlus, HD-20, & Keyboard Cover	18.00
LaserWriter Cover	17.00
Ergotron	
MacTilt *(Mac 128/512K or MacPlus Version)*	75.00
MacBuffer 256K	249.00
MacBuffer 512K	369.00
MacBuffer 1024K	569.00
Hayes	
CH Mach IV Joystick	59.00
Innovative Concepts	
Flip 'n' File/Micro	9.00
Flip 'n' File II/Micro	18.00
Innovative Technology	
The Pocket Pack *(holds 6 disks)*	9.00
The Disk Directory *(holds 32 disks)*	18.00
The Easel *(holds 20 disks)*	12.00
The Pyramid	14.00
The Library	29.00
I/O Design	
MacPlus Carrying Case	69.00
ImageWriter Carrying Case	39.00
ImageWriter II Carrying Case	49.00
ImageWriter Wide Carrying Case	49.00

Kalmar Designs	
Teakwood Roll-Top Disk Cases:	
Micro Cabinet *(holds 45 3½" disks)*	14.00
Double Micro Cabinet *(holds 60 3½" disks)*	21.00
Teakwood Printer Stand 24"	29.00
Kensington System Saver Mac	65.00
A/B Box *(Specify Mac or MacPlus)*	65.00
Disk Case *(holds 36 Mac disks)*	19.00
Disk Drive Cleaning Kit	20.00
External Disk Drive Cover	8.00
ImageWriter or ImageWriter II Cover	9.00
Macintosh (Plus) Dust Cover	9.00
Mouse Cleaning Kit w/Pocket	17.00
Mouse Pocket	8.00
Mouseway *(Mousepad)*	8.00
Polarizing Filter	34.00
Starter Pack *(includes Tilt/Swivel)*	59.00
Surge Protector	35.00
Tilt/Swivel	22.00
Control Center	65.00
Printer Stand	18.00
Copy Stand	22.00
Kette Group	
MacNifty Joystick Convertor	35.00
MacNifty Stereo Music System MNS-200	75.00
MacNifty Stereo Music System MNS-300 *(Dolby,Bass,Treble)*	99.00
Kraft QuickStick III	49.00
MacMemory, Inc.	
MaxChill *(Internal Piezo-Electric Fan)*	37.00
Moustrak MousePad 7" x 9" Size	8.00
MousePad 9" x 11" Size	9.00
MPH Computer Products	
MAC-B-COOL	99.00
N² Products Inc.	
MacPlus to ImageWriter II Cable *(6 feet)*	19.00
MacPlus to DB-9 Adaptor Cable	19.00
MacPlus to SCSI Drive Cable	24.00
MacPlus to SCSI Daisychain Cable	29.00
Ribbons Unlimited	
Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold	
ImageWriter Ribbon-Black	4.50
ImageWriter Ribbon-Color	5.00
ImageWriter Rainbow Pack *(6 Colors)*	25.00
ImageWriter II-Four Color Ribbon	12.00
Smith & Bellows	
Hand Crafted Mahogany Disk Case: Holds up to 90 Diskettes	27.00
Hand Crafted Basswood Disk Case: Holds up to 90 Diskettes *(Natural or Stain)*	19.00
Systems Control	
MacGard Surge Suppressor	55.00
X-10 (USA) Inc.	
X-10 Powerhouse Computer Interface	65.00
X-10 Wall Switch Module	15.00
X-10 Lamp Module	15.00
X-10 Appliance Module *(Specify 2 or 3 Pin)*	15.00

Books

Microsoft Press	
Creative Programming in Microsoft Basic	15.00
Command Performance: Microsoft Excel	20.00
Excel in Business	18.00
Inside MacPaint	15.00
Macintosh Midnight Madness	15.00
MacWork/MacPlay	15.00
Microsoft Macinations	16.00
Microsoft Multiplan: Of Mice and Menus	14.00
Microsoft Works on Apple Macintosh	15.00
Presentation Graphics on Macintosh	15.00
The Apple Macintosh Book Vol. 2	15.00
The Printed Word	14.00

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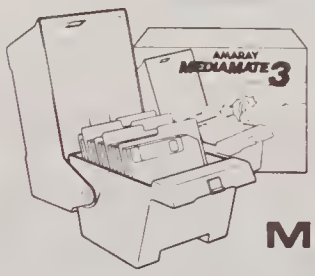
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maxell 3½" DS/DD....	1.49 ea	1.44 ea	1.39 ea
BASF or Nashua 3½" SS/DD....	1.09 ea	1.04 ea	.99 ea
BASF or Nashua 3½" DS/DD....	1.39 ea	1.34 ea	1.29 ea

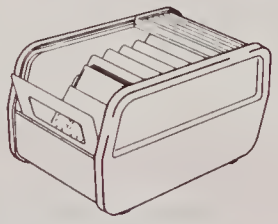
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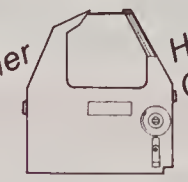
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ing to get to a stable release that I can upload to CompuServe for testing. It's now up to almost 48K of tight assembly code. It's become the largest and most complicated program I've ever written.

Servant has four major parts. The first and most important is the second-generation Finder aspect. Mac users are lucky that competition forces constant improvements in applications software like spreadsheets and databases. But the Finder has no real competition; since it is a very important program, it deserves to evolve, too. The second part is the overlapping window *Switcher* functionality. It improves on *Switcher* by keeping all the windows visible on the screen, a more intuitive approach that will become increasingly important as the screens get larger. The third part is resource moving and editing. Right now the Mac system has grown fairly complex. Most users don't understand *ResEdit* and need the help of an expert to configure their System file. I want to turn all users into experts by making *Servant* the resource editor for the rest of us, leveraging off the Finder metaphor that everyone is already comfortable with.

The fourth and final part of *Servant* is its scripting capability, which I haven't really started to work on yet. One of the major weaknesses of the Macintosh is that users can't write scripts for repetitive commands like they can on UNIX machines. The Finder is sort of Grand Central Station for applications, so it is the appropriate place for a scripting mechanism. I can use the Finder metaphor to create a really neat icon-based scripting language that will hopefully be easy to understand and fun to use.

Like *Tempo?*

Well, it covers the same area of functionality as *Tempo,* but the approach I'm taking is completely different. *Tempo* is not very robust since it depends on the physical mouse-click level instead of the semantic level. I've invented a mechanism I call *puppet strings* that allows *Servant* to make semantic requests like "quit" or "open this file" to applications. The scripting is probably the most difficult part of *Servant;* I must supply puppet string resources for all of the most popular applications in order for the program to catch on with users. I'm not sure I can pull it off, but it's worth trying. □

Interviewed by Jerry Borrell

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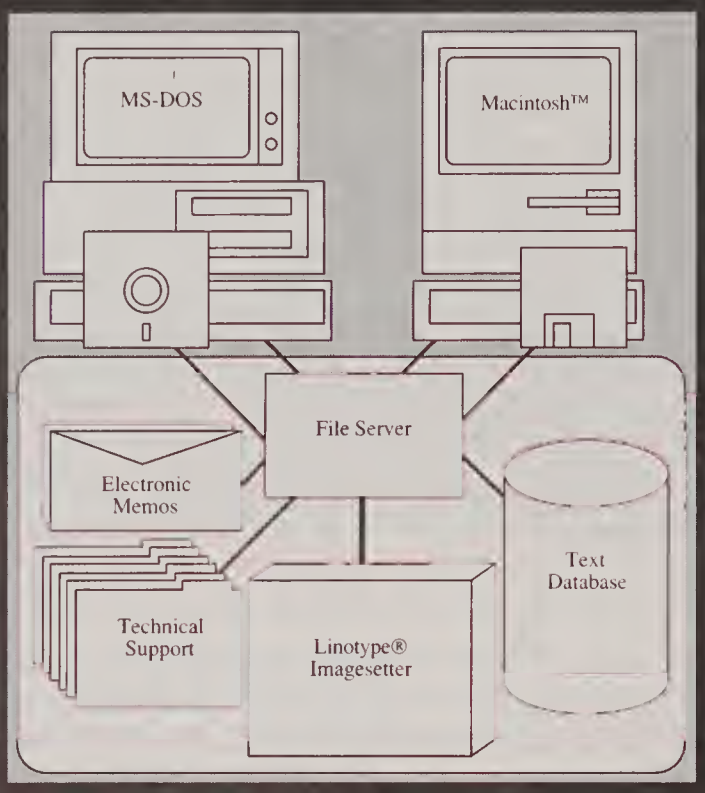
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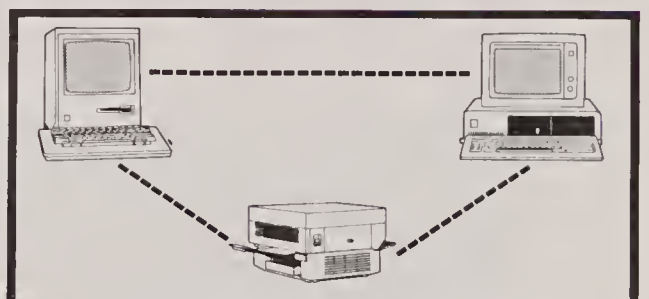
For too long, Macintoshes and PCs have been feuding like the Hatfields and McCoys, unwilling to even acknowledge each other's existence. But now, with PC MacBridge as matchmaker, the two are brought together in a network where they can love, cherish, and share files and printers with each other.

All in the family

PC MacBridge Plus is a family of products that enable Macintoshes and IBM PCs to share information and peripherals within an AppleTalk network. PC MacBridge Plus includes a PC half-card with network software. Also included are LaserScript/Plus, LaserGraph and MailBox software. LaserScript/Plus and LaserGraph allow an IBM PC to use the LaserWriter or other PostScript printer while MailBox transfers files around an AppleTalk network.

Invite the relatives

The PC MacBridge family tree also includes PC MacServe,* which permits hard disk sharing by both IBM PCs and Macs within a network. PC MacTxt allows you to transform PC files into Mac files and vice versa. And PC MacSpool frees computers for other tasks during any print job.



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Macworld News

by Daniel Farber



MARK HANAUER

Richard Furno, assistant art director of the* Washington Post, *has developed software for producing bird's-eye views of the globe.

See the World with a Macintosh

A mapping software package for printing an accurate drawing of the globe, from any viewing position and angle, is available for the Mac as an add-on module of Diehl GraphSoft's *MiniCad*. Originally developed for plotter output from the IBM PC by Richard Furno, assistant art director of the *Washington Post*, the Azimuth *MiniCad* package is expected to have wide appeal for desktop publishing applications that deal with large maps and bird's-eye views of geographical information. Furno had long wanted to convert the product for the Macintosh to take advantage of the Mac's dominance of the newspaper graphics industry and the Mac's superiority for graphics and publishing applications.

The conversion of Azimuth for the Mac has been greatly simplified by linking up with *MiniCad* and its three-dimensional modeling capability. The original *MiniCad* is available for $395 from Diehl GraphSoft of Ellicott City, Maryland. The combined Azimuth *MiniCad* package is $795.—*Stuart Silverstone*

3-D Digitizing

Graphic animation processors costing over $150,000, like those manufactured by Wavefront, Bosch, and Iris, are now commonly used by the television and film industries. While such high-end machines are very good for animation, constructing the 3-D wire-frame diagrams that form the basis of the animations is a complex, time-consuming task. Traditionally, the artist has either had to hand-draw the object or manually enter its individual coordinates.

Now artists are using the Macintosh in conjunction with these high-end computers to eliminate much of the drudgery and lower the cost of producing images. For example, with the 3-D Digitiser from Captain Computer, artists can create objects in 20 percent of the time required by previous methods. Codeveloped by Michael Smith (formerly a key software programmer for Bosch FGS 4000) and Captain Video of France, the 3-D Digitiser combines the Mac with the 3 Space digitizer from McDonnell Douglas. The 3-D Digitiser can scan objects with a volume of up to 32,000 cubic feet (about 42 by 42 inches) and has a resolution of .03 inch. You can view an object from various angles and perspectives, remove or add a polygon, and edit it during the digitizing process or at a later time. It is also possible to derive 3-D objects mathematically. In addition, the 3-D Digitiser does solid modeling, provides eight gray levels for shading, and lets you save images as PICT files.

The 3-D Digitiser costs $25,000 and includes all the necessary hardware and software except the Mac itself. For more information contact Captain Computer, 675 Third Ave. #2400, New York, NY 10017, 212/682-8867.—*Prasad Kaipa*



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Captain Computer's $25,000 3-D Digitiser combines the Mac with the 3 Space digitizer from McDonnell Douglas. The Digitiser enables artists to construct 3-D wireframe diagrams and solid models.



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Multilingual Macintosh

Automated Language Processing Systems (ALPS) is developing a multilingual dictionary for the Mac. Dictionaries for English, Spanish, Italian, French, German, Dutch, and Portuguese will be stored on CD ROM, and entries displayed on the Mac screen will include the same information as a standard dictionary. The company plans to add full grammar-checking, such as subject and verb agreement, in future versions of the product. In addition, it will have tables for time zones, measurement, and international currencies. Add-on dictionaries for specific industries, such as banking, are also under development. For more information contact ALPS, 190 W. 800 North, Provo, UT 84604, 801/375-0090.

Softstyle

A large part of the Mac's appeal is that it makes most tasks effortless—to save data, manage memory, or print files you merely click the mouse button. That simplicity and ease of use are the result of some very complex software. In the case of printing, the leading developer of *drivers*—the software that allows programs to produce text and graphics on a printer—is Softstyle of Honolulu, Hawaii.

Softstyle has developed drivers for a wide variety of printers, including the Hewlett-Packard LaserJet and ThinkJet printers as well as several dot matrix and letter-quality printers from Texas Instruments, Epson, and Toshiba. In addition, the company produces *ColorMate,* color-printing software for the ImageWriter II, and *Plotstart* for the popular HP ColorPro plotter.

"There are misconceptions about the print quality of non-laser, non-Apple printers for the Macintosh. Many alternatives exist that provide letter-quality or near-letter-quality text as well as graphics," says Softstyle president Craig Slayter. "In fact, Mac owners have a variety of printer choices similar to those of IBM PC owners. The Brother Twinriter 5, for example, lets you mix graphics with letter-quality text." (Softstyle wrote the *Brother MacDriver,* a set of printer drivers that allow you to print on Brother daisy wheel and dot matrix printers.)

Softstyle's latest product, *Printworks for the Mac,* provides printing enhancements for the ImageWriter II, especially for color printing, and also includes drivers for 20 other dot matrix printers. The Chooser desk accessory has been modified so that you can select printer ports and baud rates to accommodate different printers. You can preview pages before printing and skip those you don't want to print. *Printworks* also provides spooling and mapping of screen fonts to printer fonts. Softstyle plans as well to introduce a series of drivers for the most popular daisy wheel printers. For more information contact Softstyle at 800/367-5600.

LINNY MORRIS



More printers working with the Mac is Softstyle president Craig Slayter's goal.



FRED STIMSON

If you need advice on laying out a newsletter or selecting a typeface, try consulting one of several books on desktop publishing.

Desktop Publishing Bookwares

PostScript (Adobe's page-description language for the LaserWriter), along with the software tools developed for creating publications, has made graphic design and typography important considerations for many of us who had previously dealt with only one-column, near-letter-quality output. Several available books help to explain the ins and outs of desktop publishing, including *The Art of Desktop Publishing* (Bantam), *Desktop Publishing from A to Z* (McGraw-Hill), *Desktop Publishing* (Dow Jones-Irwin), and *Laser Print It* (Addison-Wesley). If you're a novice desktop publisher, you may also benefit from consulting one of the classic works on graphic design, such as *Publication Design* by Allen Hurlburt or Adrian Wilson's *The Design of Books,* (both from Van Nostrand).

For those interested in learning more about PostScript, Adobe publishes a superbly designed newsletter, *Colophon,* which provides information about PostScript and the Adobe font as well as tips on using PostScript. To subscribe, contact Adobe Systems, 1870 Embarcadero Rd., Palo Alto, CA 94303. A two-volume PostScript technical manual is available from Addison-Wesley.

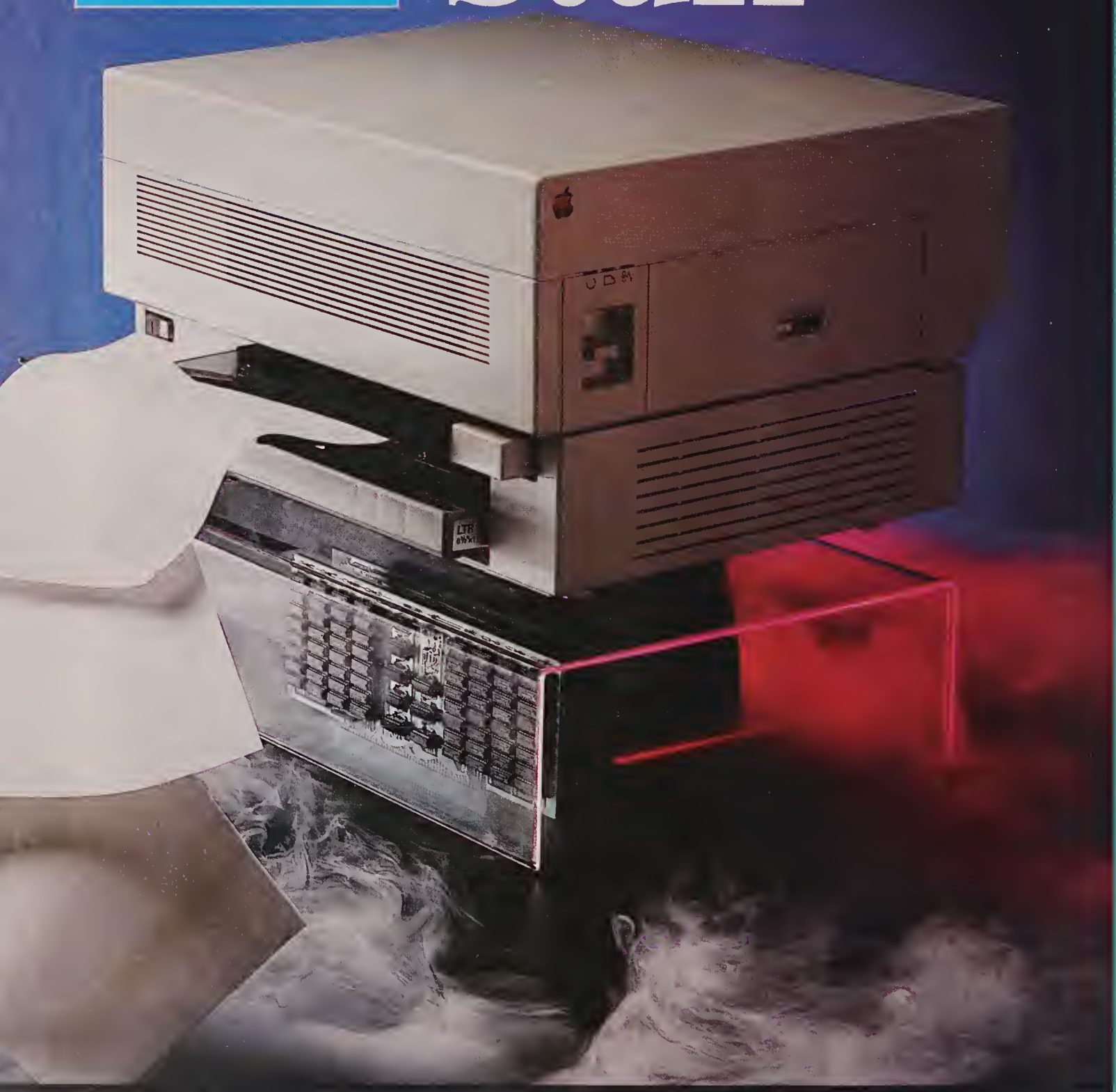
X*Press

Sometime early this year, Mac users will be able to receive the latest news, weather, sports, and economic reports from more than 30 international wire services including UPI, AP, Business Week, Standard and

(continues)

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The Write Stuff



The LaserServer™ from DataSpace™ is a true multi-user print server allowing several Macintoshes on the AppleTalk™ network to send print jobs to the LaserWriter simultaneously. Not only does the LaserServer handle simultaneous transmissions, it also buffers each print job being sent to the LaserWriter, freeing each Macintosh up to 80% sooner. This combination yields tremendous time savings and dramatically increases the productivity of the LaserWriter.

If your environment has a LaserWriter shared by two or more Macintoshes, then you have already experienced the aggravation of waiting for the LaserWriter, while you could be doing something else.

The LaserServer incorporates a slot system for maximum expandability, it comes in a minimum 2 megabyte configuration, expandable up to 12 megabytes. The slot system also allows for other future enhancements cards such as downloaded fonts etc.

To manage the printing jobs in the LaserServer, one Macintosh on the network is designated as the 'print manager'. The print manager is capable of setting priority levels for all Macintoshes on the network, allowing the most important users faster access to the actual printing on the LaserWriter.

Each Macintosh on the network has its own desk accessory which enables it to monitor the position of its print jobs in the LaserServer queue, and even allows print jobs to be deleted instead of being printed. Other functions of the desk accessory permit each user the option of being informed when its print jobs are completed, or when manual feed jobs are ready.

The LaserServer from DataSpace was designed specifically to enhance the performance of each Macintosh on the AppleTalk network using Apple's LaserWriter. If your corporation or organization use the LaserWriter with two or more Macintoshes, the LaserServer will help you maximize your network and improve its productivity.

Key Features:

- fully Macintosh, LaserWriter and AppleTalk compatible
- true multi-user capabilities
- 2 megabytes of memory expandable to 12 megabytes
- up to 80% time savings per user
- expansion slots for further enhancement cards
- status display

Specifications

- processor MC68000 @ 10MHz
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Specifications subject to change without notice

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*X*Press (continued)*

Poor's, the New York Stock Exchange, TASS, Agnet France Press, and McGraw-Hill (all the services are in English except Notamex from Mexico, which comes in Spanish). The service will be transmitted over regular TV cable, rather than phone lines, on a constant feed by satellite from Golden, Colorado. This 24-hour, cable-to-computer data service, called X*Press, will cost less than $20 per month.



X*Press Information Services, which has already designed software for the IBM PC and compatibles as well as the Apple IIe and IIc, is currently working on a Macintosh version. It will include a dynamic word-search provision that will allow subscribers to select a few keywords before going to bed. During the night X*Press will download into RAM only those stories that contain the keywords. In the morning the worthwhile stories can be saved to disk or printed—but only for personal use. Newspapers and broadcasters must still pay the full fee for wire services.

A preview demonstration of X*Press reveals a well-designed, accessible source of contemporary world news and up-to-date financial information. Useful for people who follow late-breaking news, the system even scoops the morning newspaper. For more information, contact the company at 1536 Cole Blvd., Bldg. 4 #250, Golden, CO 80401, 800/772-6397.—*Mark Dowie*

New Typefaces

CasadyWare, formerly Casady Company, recently announced several new laser typefaces, as well as additions to two of the company's existing font families, Bodoni and Sans Serif. The new typefaces include Gregorian, an Old English font; Dorovar, Zephyr Script, and Coventry Script, which are calligraphic fonts; Micro, a modern, squarish text font; Gatsby Light, a Deco-style font; and a Russian/Ukrainian font. Each volume, which typically includes four fonts, is available for $69.95. For more information contact CasadyWare, P.O. Box 223779, Carmel, CA 93922, 408/646-4660.

Apple Funds Research

Universities have long been adjunct research facilities for high-tech companies. Apple is no exception, having research agreements with several institutions of higher learning. One recent recipient of Apple research funds and equipment is the Center for Information Technology Integration (CITI) at the University of Michigan, Ann Arbor. A member of the Apple University Consortium, Michigan has more than 8000 computers campuswide, including 3000 Macs. The university plans to use the $293,000 grant and $113,000 in equipment to develop hardware and software to integrate current and future computer facilities within the university environment.

"Our goal over the next decade is to produce a single, common interface across all our vendors' products, so that printing, file access, electronic mail, and other computer services will be available throughout the campus, regardless of the computer used. The Macintosh is a logical choice for the interface because of its ease of use and graphics capabilities," says Douglas E. Van Houweling, vice-provost for information technology at the university.

Already the university has created interfaces that allow the Mac to be used as a front end for the more than 200 Apollo workstations in science and engineering laboratories. The Apple-funded research will focus on the creation of communications software that allows Macs on an AppleTalk network to access files from Apollo computers on an Apollo Domain network. In addition, research will focus on enhancing the UNIX operating system to handle interprocess communications.

Building links between different computers will make information more accessible, and Van Houweling asserts that with the Macintosh, students will be able to use the power of more expensive computers like the Apollo.



MICHAEL ABRAMSON

At the University of Michigan, Douglas E. Van Houweling is putting Apple research funds to use.



New printers from TI will compete with the LaserWriter.

Laser Printers from Texas Instruments

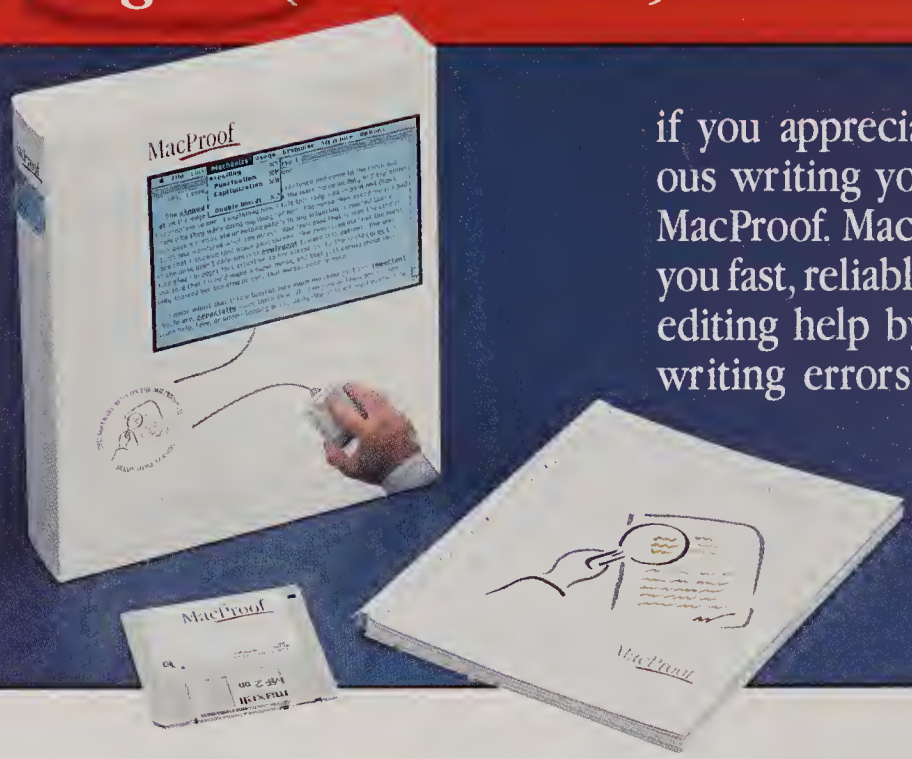
Desktop publishers and network users will welcome Texas Instruments' two new PostScript laser printers, the OmniLaser 2108, an 8-page-per-minute device, and the 15-page-per-minute 2115. Unlike Apple's LaserWriter, which is based on the Canon print engine, both Omni Series printers incorporate Ricoh print engines that were designed for much heavier use. The 2108 is designed to print up to 10,000 pages per month, compared to the LaserWriter's capacity of 3,000 pages per month, and the faster 2115 can handle up to 25,000 pages per month. Renae Clepper, product manager for the Omni Series printers, points out that printers like the LaserWriter, which use the Canon engine, are not suitable for high-volume print

(continues)

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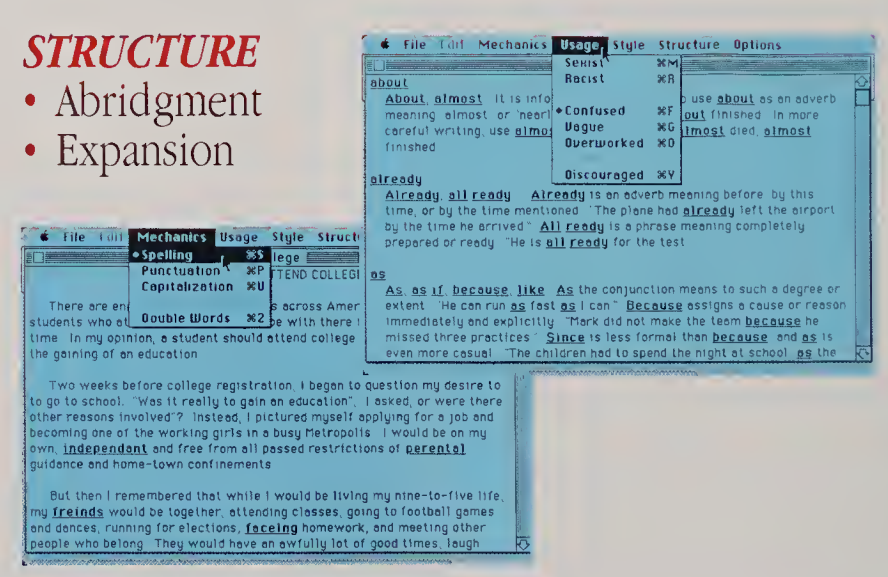
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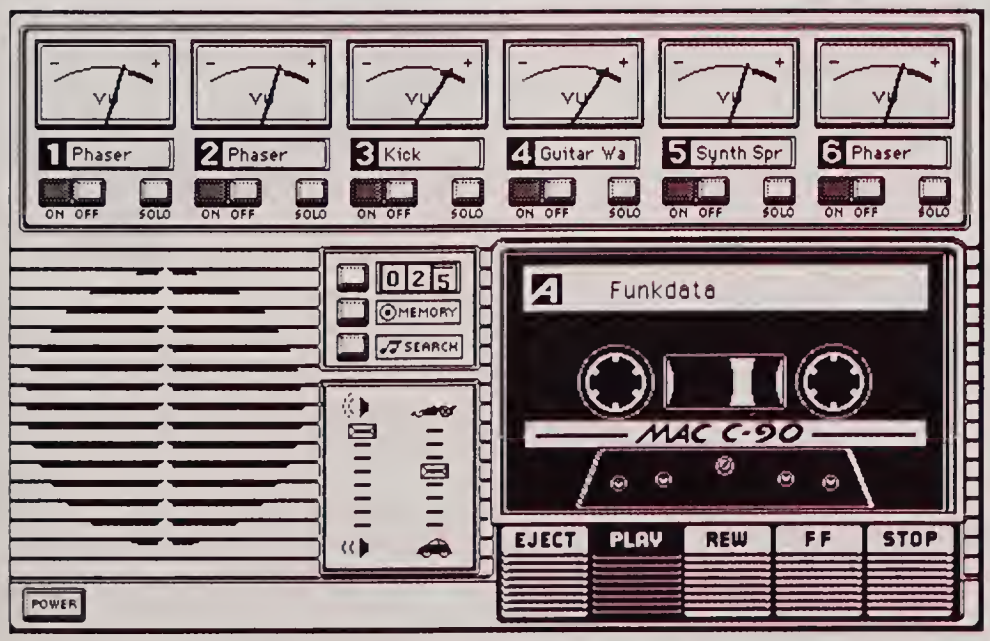
Laser Printers from Texas Instruments (continued)

applications. In fact, Clepper states that even low-volume users often overextend a laser printer's duty cycle by regularly printing multiple copies of documents rather than copying them.

Both Omni Series models print at 300 dots per inch, and according to Clepper, because of the printing technique used by the Ricoh print engine, both are capable of printing denser blacks than the LaserWriter. The 2108, priced at $5995, includes one 250-sheet-input paper tray, while the 2115 ($7995) includes two trays capable of holding letter-, legal-, or A4-size paper.—*David Ushijima*

Mac Session Musician

Studio Session by Bogas Productions is a unique music-composition application. Although the program is not MIDI compatible and input is limited to the click-and-drag, cut-and-paste method of its predecessor *MusicWorks,* it offers a wealth of authentic instrument sounds. You can choose from 90 different instruments, ranging from percussion devices to whooshing synthesizers. And *Studio Session* has six-track recording capability (compared to four in other non-MIDI Mac programs). Also included are twenty-four prewritten songs—from an orchestrated Latin percussion piece to a recorder quartet—that give you a good sense of the program's flexibility. For more information contact MacNifty Central, 6860 Shingle Creek Pkwy. #110, Minneapolis, MN 55430, 800/328-0184.—*Otto Waldorf*



Studio Session ***from Bogas Productions features a simulated tape player, complete with six-track recording capability, a musical notation editor, and 90 authentic instrument sounds.***

Game Highlights

People are using the Macintosh primarily for business and higher education, but that doesn't mean they don't play games. Game developers on the Mac are producing new challenges every month. Among them are *Ferrari Grand Prix* and *Patton versus Rommel.*

Ferrari Grand Prix, from Bullseye Software (P.O. Box 7900, Incline Village, NV 89450), is a Formula-One racing simulation that puts you at the wheel of a grand prix racing car. A variety of tracks challenges your driving skills with



FRANK WHITNEY

New games for the Macintosh offer a unique challenge for military strategists as well as would-be grand prix race-car drivers.

devilish curves, tricky chicanes, and one course designed specifically for ultrahigh speeds. Additionally, *Ferrari Grand Prix* provides a neatly packaged option for designing your own courses.

Chris Crawford, designer of *Balance of Power,* has created a new Macintosh game: *Patton versus Rommel,* which pits these two famous warriors against each other on D-Day 1944. The simulation lets you assume the role of either general to fight for control of Normandy. The program features animated battles with sound effects, historically accurate simulations of battle conditions and geography, advice based on the respective generals' battle strategies and tactics, and a game editor that lets you modify the fundamental values (computer, not ethical) that shape the game. For more information contact Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/572-2787.

The Great C Debate

C on the Macintosh was the topic of discussion at a fall meeting of the Macintosh Software Entrepreneurs Forum (SEF) in Cupertino, California. Representatives from Consulair Corp., Greenhills Software, and Think Technologies were invited to speak and field questions about their Macintosh C development systems and the future of software development in C on Mac systems.

The evening began with David Smith, editor and publisher of *MacTutor* magazine, outlining what he perceived as the strengths and weaknesses of today's development systems and providing his view of the "ideal future" for Macintosh development environments. Smith cited lack of HFS compatibility, sparse documentation, and lack of easy-to-use debugging tools as the major problems with Mac development systems.

Following Smith's introduction, representatives from the compiler publishers presented overviews of their respective implementations of C on the Macintosh. Carl Rosenberg of Greenhills Software outlined the history behind the MPW C compiler, which Apple has licensed from Greenhills. Because of MPW's previous implementation on minicomputers, Rosenberg said that it provides a robust, efficient, and proven compiler for the Mac.

The other vendors took the opportunity to introduce new versions of their compilers. Michael Kahl, author of Think Technologies' *LightspeedC,* described the additions he made to the current version of his

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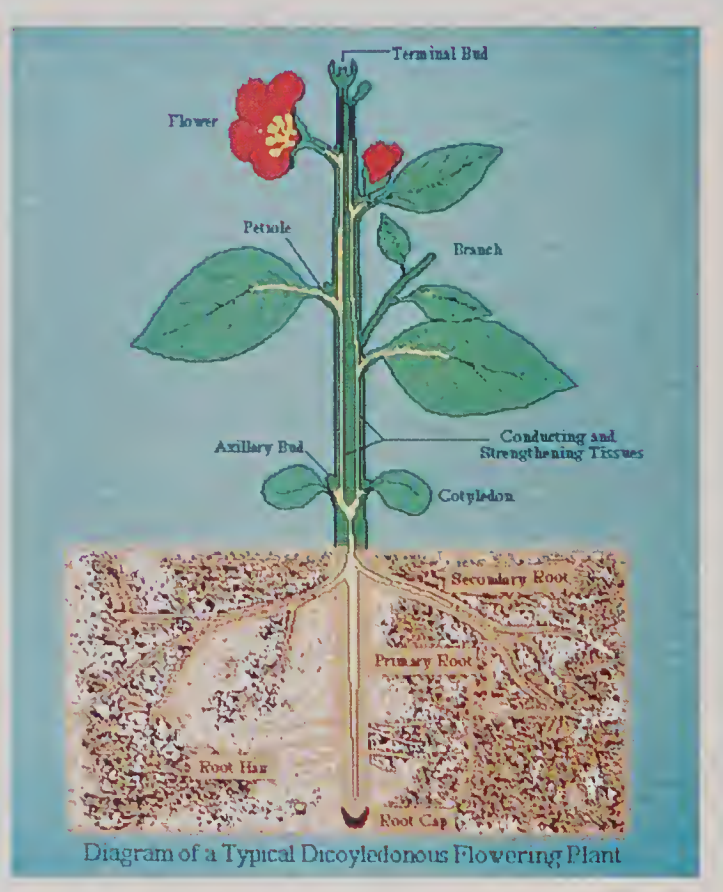


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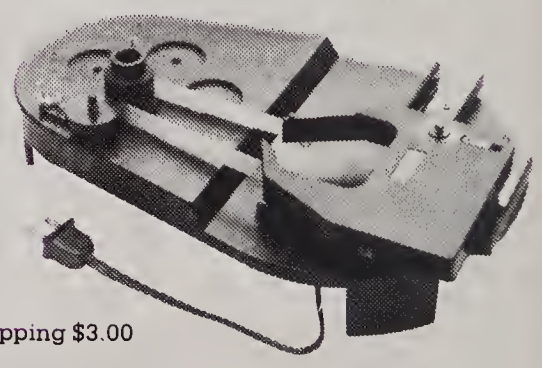
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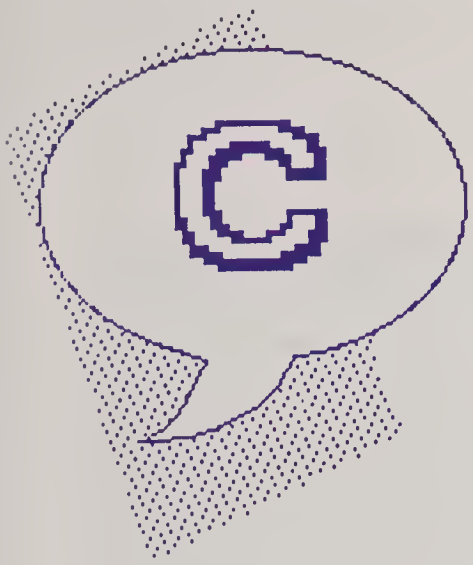
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The Great C Debate (continued)

compiler. In-line assembly language and some features that make it easier to navigate through projects were the highlights of his presentation. Consulair's Jay Friedland announced the implementation of Pascal types and an overall doubling of its compiler's speed. He also discussed Consulair's timely updates, noting that Consulair's was the first HFS-compatible development system. Not a compiler manufacturer, but a panelist nonetheless, was Steve Jasik of *MacNosy* fame. Jasik suggested that all compilers be standardized in an output format that would



provide a uniform foundation for debugging tools. Jasik also introduced his new debugger and outlined his ideas for the source-level debugger he hopes to have ready by the first quarter of 1987.

The question-and-answer session emphasized the implementation of object-oriented C and the ANSI C standard on the Mac. All three compiler manufacturers showed interest in object-oriented C, pointing to a recent implementation proposal by Apple. Although open to compliance with the proposed ANSI standard, the manufacturers said they'd rather wait for market demand to generate the de facto standard.
—Jim Takatsuka □

UNIX Mac

EuroSoft International has developed a package that turns the Mac into a UNIX workstation and replaces the complicated UNIX command structure with an iconic shell and file system that mimics the Macintosh user interface. *MacNIX* displays both UNIX directories and Mac applications and data as windows. Every common UNIX file type has an icon associated with it so that you can transfer files between the two systems simply by dragging icons to the appropriate window. *MacNIX* also allows you to leave the Mac environment and input UNIX line commands directly in the standard UNIX shell whenever aliases, pipes, shorthands, or other UNIX facilities are needed. The Macintosh connects to the UNIX host via modem at 300 to 9600 bits per second.

The product comes at a time when Apple purportedly is working on its own implementation of UNIX for the next-generation Macintosh. For more information about *MacNIX,* contact EuroSoft, 14082 Loma Rio Dr., Saratoga, CA 95070, 408/741-0739.



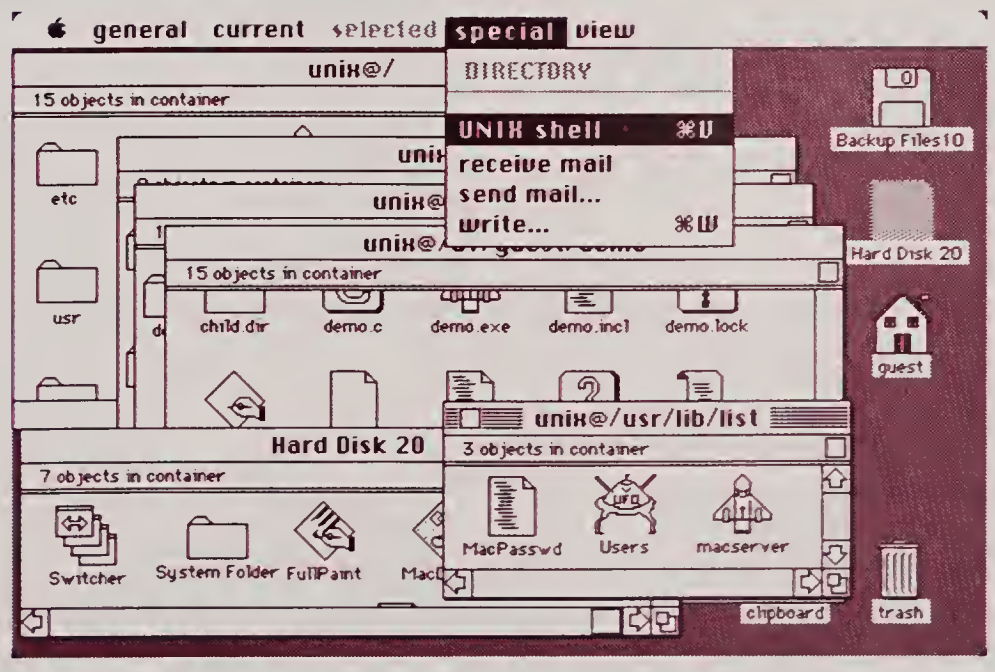
Steve Jobs mulls over the future of desktop publishing.

Designer Layouts

At a speech given last fall at the Seybold conference on desktop publishing, Steve Jobs said that the desktop publishing market is in transition, and he predicted that within two years the unique features of page-layout programs will be built into word processors or other applications. In essence, although desktop publishing is a fashionable new market today, Jobs expects it to soon be just one of many available tools.

Jobs also foresees some other changes growing out of the desktop publishing phenomenon. Designer layouts—templates created by famous graphic designers like Paul Rand or Milton Glaser—could be purchased to format documents. By improving the quality of the aesthetic environment, Jobs maintains that not only will we produce better-looking documents, but we'll communicate information more effectively.

You may not need designer layouts, but in the next few years we're certain to see an expert system that helps amateur graphic designers make layout and typography decisions. Better yet, we may see a program that can scan a document and intuit rules to turn a formless jumble of text and graphics into a tasteful, visually stimulating document.



EuroSoft International's* MacNIX *transforms the Mac into a UNIX workstation, complete with an iconic shell and file system that emulates the Macintosh user interface.

More Desktop Publishing

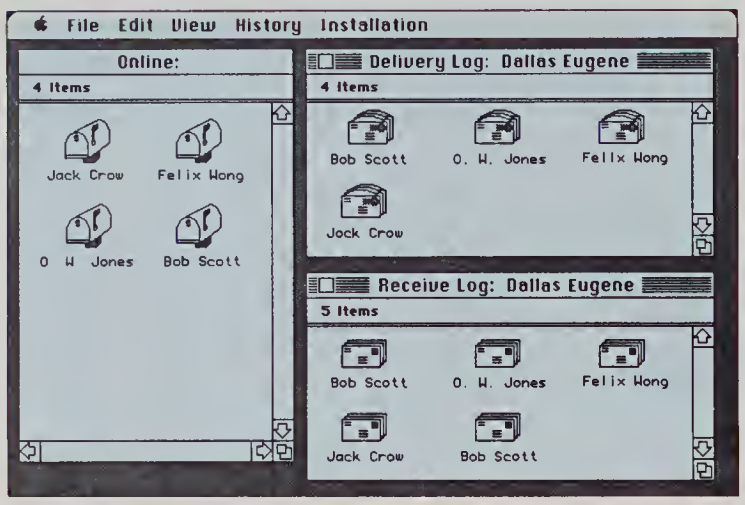
The success of desktop publishing on the Macintosh is nowhere more evident than in the proliferation of Mac publishing packages. In the last year the number of programs has grown from three to at least seven, and the trend is toward more specialized applications. The latest offerings are *XPress* from Quark, Inc., which is designed to handle large documents (several hundred pages), and *TechScriber* from Mansfield Systems, aimed at producers of technical manuals, journals, and books.

XPress offers precision typographic controls such as leading, kerning (manual, automatic, and track), condensed and extended text for copy fitting, and automatic hyphenation. Also available are an inter-

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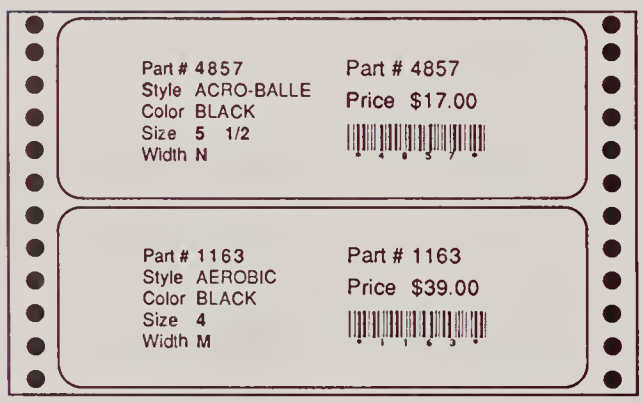
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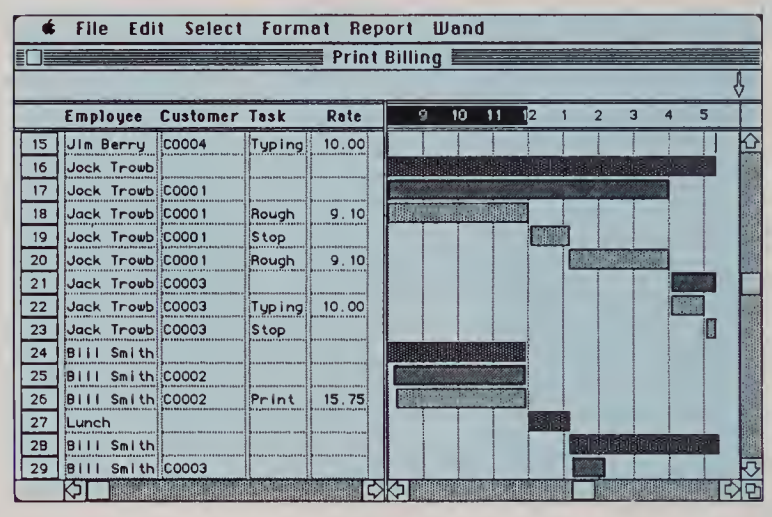


Bar Code Labeler allows you to design custom labels. All of the Macintosh font and type styles can be used to print mailing labels, bar code labels, or virtually any other type of label. Bar Code Labeler uses information from any program that saves information in a text format such as OverVue, Omnis 3, and MacWrite. Bar Code Labeler will print on label stock using either the LaserWriter or ImageWriter printers.

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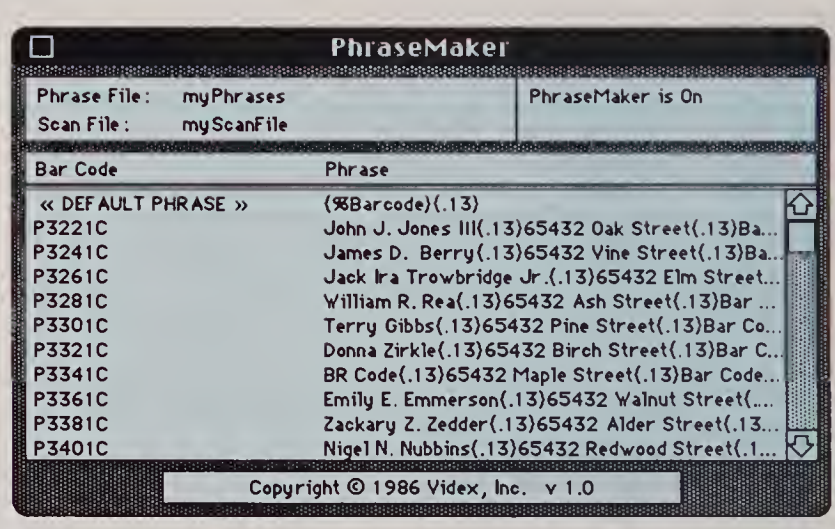
The TimeWand is an intelligent yet inexpensive bar code reading system. With its built-in micro-processor and up to 16K of memory, the TimeWand can be programmed to read different types of bar codes. Different program options can be selected, such as requiring the bar codes to be scanned in a predetermined order. The TimeWand's recharging/downloading station uses a serial connector to communicate with a variety of host computers. Since communication is keyless, the scan information is sent quickly and error free. Versatility is the hallmark of the TimeWand system.

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More Desktop Publishing (continued)

nal spell-checker (50,000 words) and font sizes from 2 to 500 points. Other features include adjustable line thicknesses, line-end cap selections such as arrowheads and bullets, spot color assignments for automating color separations, and registration marks. The program has a frame editor so that you can customize borders around boxes. It also lets you specify shading and color and directly import graphics as well as tabular information. For more information about *XPress* contact Quark, Inc., 2525 W. Evans, Denver, CO 80219, 303/934-2211.

TechScriber handles page layout, text editing, and formatting and allows you to create tables, diagrams, and mathematical expressions. The $395 program lets you access *FullPaint* and *Cricket Graph* from within it, so that graphic data can be created and edited easily. For more information contact Mansfield Systems, 550 Hamilton Ave. #200, Palo Alto, CA 94301, 415/326-0603.

MS-DOS on the New Mac

Hunter Systems of Palo Alto, California, is developing software that will enable owners of 68020-based machines to run software written for the IBM PC and its clones. According to Colin Hunter, the first version of XDOS will convert MS-DOS applications into programs compatible with these non-DOS systems. XDOS will initially run on the Sun/3 workstation under the UNIX operating system and is scheduled for release in early 1987. Since the Sun/3 contains a 16-MHz 68020 processor, XDOS could also allow owners of Apple's rumored 68020-based machine to run IBM PC software.

Hunter says that XDOS will allow owners of non-MS-DOS

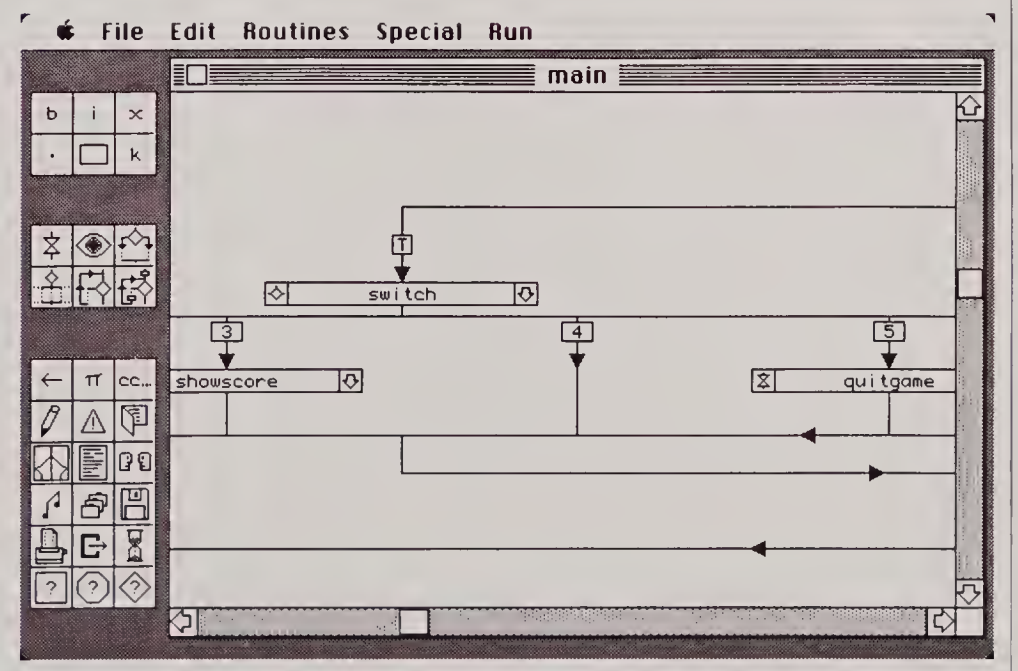


machines to benefit from advanced workstation products and still run MS-DOS applications as fast or even faster than they could on a PC AT. "What the world wants is not an IBM PC, but rather the ability to run PC software," says Hunter. By mimicking DOS, PC ROM routines (BIOS), and screen memory, an application running under XDOS executes just as if it were on a PC.–*David Ushijima.*

Programming with Pictures

VIP, an acronym for Visual Interactive Programming, is the first icon-based language for the Macintosh. An interpreted language, VIP allows you to access the Mac Toolbox and write structured Pascal-like programs using automatic logic forms and nested levels of routines. The graphics editor displays a kind of flowchart that makes it easy to visualize the program's structure. The language comes with 174 precompiled routines built into 15 classes (represented by icons), including assignment, mathematics, events, strings, menu, windows, text dialogs, sound, record, I/O, printer, branching, and time.

Mainstay plans to offer utilities that translate VIP programs to other languages such as *LightspeedC,* as well as supplemental procedure sets–such as a list manager, *Macintalk,* statistics, and 3-D graphics–to make application development easier. For more information contact Mainstay, 5311B Derry Ave., Agoura Hills, CA 91301, 818/991-6540.



An iconic programming language, VIP displays a graphic flowchart to show program structure and provides complete access to the Mac Toolbox.



GARY GALVIN

Apple is gaining more acceptance among major corporations, says Jack Baumann of Hughes Aircraft.

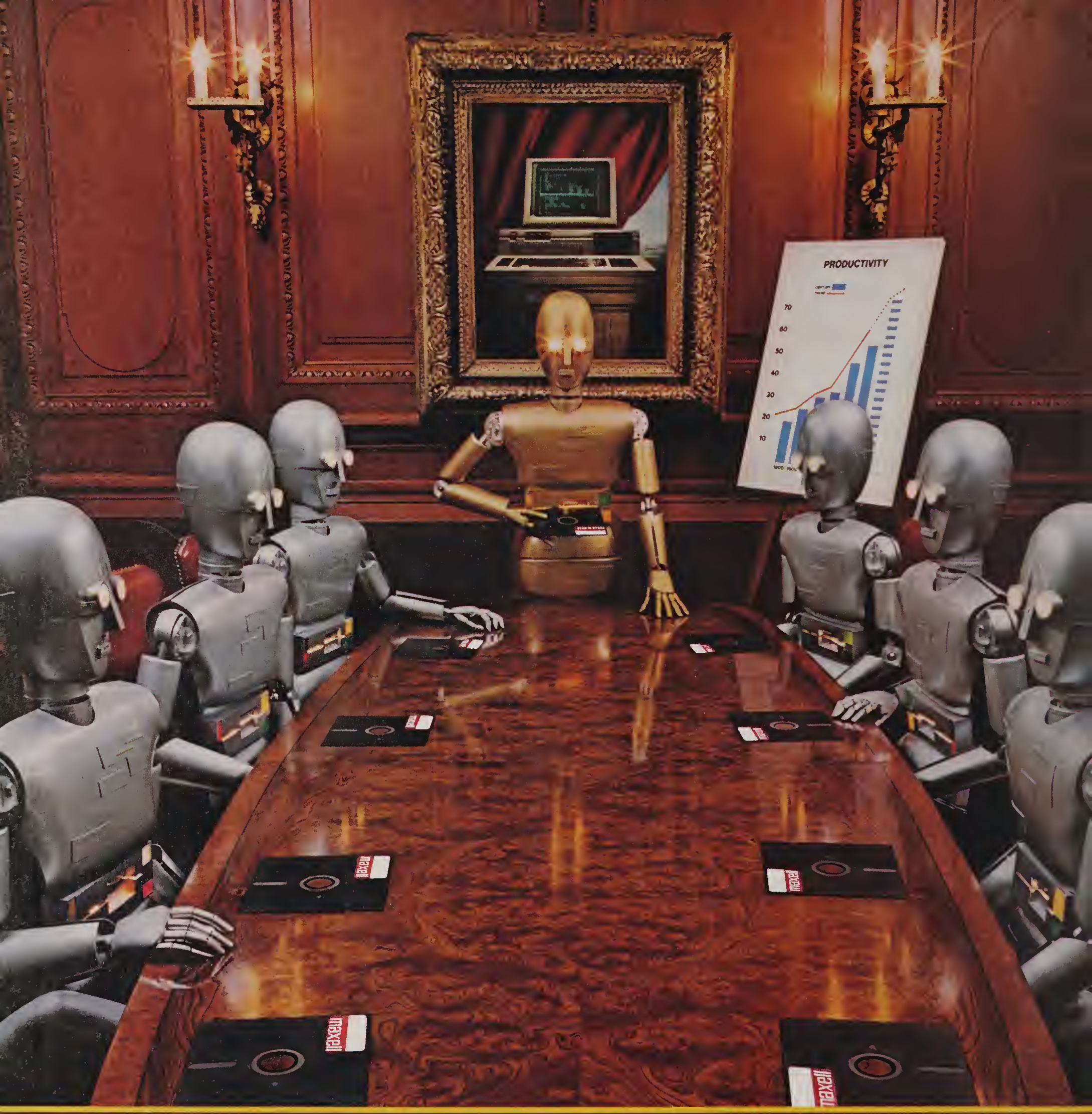
Hughes Air

Hughes Aircraft illustrates the current degree of Mac acceptance in the corporate world. The company now owns about 2000 Macintoshes, which complement a fleet of 8500 IBM PCs. The Macs are used to prepare presentation graphics from *Excel* spreadsheets–a perfect example of how high-powered software enhances the Mac's appeal.

Hughes scientists use Macs to handle problems involving such things as radio telemetry and satellite alignment, which would otherwise be assigned to more high-powered machines like Digital Equipment's VAX. Processing information takes longer on the Mac–say, 45 minutes versus 15 on the VAX–but the larger computers cost more, are scarce, and are often booked up for days in advance. In the long run, using the Mac saves time and money.

Desktop publishing has also become important to Hughes. The LaserWriter churns out high-quality forms for many auditing functions, and engineers use the printer for organizational charts and project diagrams. In this area of graphics production, the Mac has a clear advantage over other comput-

(continues)



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ers. Paul Lucero, a computer consultant working for Hughes, says, "You pay less for better graphics. The Macs aren't going to put IBM out of business, but they definitely have a place in our company."

One area where the Mac is not yet making headway at Hughes is in systems engineering. With new products coming from Apple to upgrade the computer's speed, computational power, and design capabilities, engineering tasks may soon be done on the Mac.

The Hughes people are typical of officials and analysts at many companies who cite what they say is an improved business awareness at Apple. "It's clear that they're trying to portray a more businesslike atmosphere in dealing with corporations," says Jack Baumann, section head for the Hughes microcomputer consulting department. That means shaking off the Apple II image, becoming more market oriented, and listening better to what companies want and need. Those intangible factors are important in the eyes of upper management.—*Robert Buderi* □



FRED STIMSON

The similarities between the Mac and Apple IIGS interfaces are apparent in this example using Great Wave's* Kid's Time. *However, programs like* Excel *probably won't be adapted for the GS.

And on the Apple IIGS



The new Apple IIGS, which has built-in QuickDraw programming that helps put the familiar Macintosh interface on the screen, will soon be sporting some of the Mac's programs as well. Among those being readied are Monogram's *Dollars and Sense,* Chang Labs' *Rags to Riches,* Mindscape's game series, and Great Wave's *Kid's Time.* Since the interfaces are similar, the time and expense of recasting documentation is limited.

It remains to be seen whether the IIGS will have an impact on the Mac and Mac software sales. At this point a fully configured, top-of-the-line IIGS costs as much as a Mac Plus. Although Apple clearly differentiates the two machines by its marketing strategy—Apple II for grades K through 12 and home business, the Mac for business and higher education—there is definitely some overlap. For now, the difference between the two machines is in the level of sophistication of the software available for them.

New Magic Digitizer



A high-resolution, lower-cost digitizing scanner system for the Mac is available from New Image Technology, maker of the Magic video digitizer. Interfacing to the SCSI port of the Mac with MacScan hardware and software, the Canon IX-12 page scanner provides 300-dot-per-inch (dpi) images at a price of $1550. It is considerably less expensive, faster, and smaller than existing products with similar resolution. The system is also available unbundled for owners of the Canon hardware or for future buyers of compatible components from other manufacturers. A $300 card allows the IBM PC to interface with the scanner.

The system captures images up to 8½ inches wide from hard-copy line art, halftones, and continuous-tone photos on paper less than 11½ inches wide. Images can be saved in various formats for editing with software such as *SuperPaint* and pasteup with layout packages such as *PageMaker.*

For an additional $550, an upgraded package called MacScan Plus captures up to 256 gray levels for each scanned 300-dpi point due to installation of a hardware board into the Canon. "The upgraded system should compete in quality against $10,000 to $20,000 scanners," according to New Image Technology president Michael Fritz. "It will look like a magazine-quality, 150-line image when printed on the Allied Linotron."—*Stuart Silverstone*

The Mac as Fair-Weather Friend



Accu-Weather is the nation's principal private service for reporting weather to newspapers and TV stations. The company now creates its daily weather maps on the Macintosh and distributes them to customers' Macs via phone lines.

Called MacWeather, the new service offers subscribers a variety of informational graphics showing national and regional weather forecasts, high and low temperatures, the jet stream and its impact, and moon phases. These graphics can be sent directly to another Mac or to a LaserWriter for hard-copy printout that is pasted into a newspaper's page layout.

"The Macintosh seemed the best choice, given its graphics capabilities and existing software," says Joel Myers, president of the 20-year-old service company based in State College, Pennsylvania.—*Stuart Silverstone* □



Accu-Weather's new service offers a variety of informational graphics, such as national and regional weather forecasts, which are sent directly to subscribers and printed on the LaserWriter.

We're devoted

SOFTWARE

NCP denotes not copy-protected.
CP denotes copy-protected.

Affinity Microsystems ... NCP
Tempo *(power user's macro utility)* . . . . . $69.
Altsys ... NCP
Fontastic *(create your own fonts)* . . . . . 27.
Ann Arbor ... NCP
FullPaint *(open four documents at once)* . . 55.
Arrays ... NCP
Home Accountant *(req. external drive)* . . . . 52.
ATI ... CP
Teach Yourself Multiplan or Excel . . . . . 39.
Batteries Included ... NCP
The Mac BatteryPak *(9 desk accessories)* 27.
HomePak or Time Link . . . . . 29.
Borland International ... NCP
Sidekick w/Phonelink. . . . . 59.
Reflex *(information management analysis)* 59.
Turbo Pascal . . . . . 65.
BPI Systems ... NCP
General Accounting *(full-featured)* . . . . . 229.
BrainPower ... NCP
Think Fast *(improves recall)* . . . . . 23.
StatView *(statistics package)* . . . . . 59.
Graphidex *(DA graphics organizer)* . . . . . 75.
Designscope *(electronic circuit design)* . . 129.
StatView 512+ *(req. external drive, 512k)* . . . 179.
Broderbund ... CP
Print Shop *(create cards and memos)*. . . . . 49.
Geometry *(over 350 problems!)* . . . . . 69.
CAMDE ... CP
Nutricalc *(diet & nutrition analysis)* . . . . . 49.
Casady Company ... NCP
Fluent Fonts *(two-disk set)* . . . . . 29.
Fluent Laser Fonts *(Bodoni, Calligraphy, Monterrey, Prelude, Ritz, & Sans Serif)*. *each* 49.
Central Point Software ... NCP
Copy II Mac *(includes MacTools)*. . . . . 20.
Challenger Software ... NCP
Mac3D *(3D graphics, CAD features)* . . . . . 129.
Chang Labs ... CP
Rags to Riches Ledger . . . . . 125.
Rags to Riches Receivables *(req. 512k)* . . . 125.
Rags to Riches Payables *(req. 512k)* . . . . . 125.
Rags to Riches Three Pak. . . . . 299.
Inventory Control . . . . . 245.
Professional Billing . . . . . 245.
Cortland ... CP
TopDesk *(7 new desk accessories)* . . . . . 39.
Creighton Development ... NCP
MacSpell+ *(spell checker, req. 512k)*. . . . . 55.
Cricket Software ... NCP
Statworks *(statistical package)*. . . . . 79.
Cricket Graph *(multiple windows)* . . . . . 129.
DataViz ... NCP
MacLink *(transfer Mac/IBM data)*. . . . . 89.
Desktop Graphics ... NCP
DrawArt *(MacDraw artwork, req. 512k)* . . . . 29.
DrawForms *(requires MacDraw)* . . . . . 30.
Digital, etc. ... NCP
Maccountant *(integrated accounting)* . . . . . 99.
Turbo Maccountant . . . . . 299.
Includes GL, AR, AP, Payroll, & Invoicing.
Dow Jones ... CP
Straight Talk *(access News/Retrieval)* . . . . . 62.
Spreadsheet Link. . . . . 65.
Market Manager PLUS . . . . . 129.
Dreams of the Phoenix ... NCP
Day Keeper Calendar. . . . . $35.
Quick & Dirty Utilities Vol. 1 or Vol. 2. . . . . 35.
Twelve-C Financial Desk Accessory. . . . . 35.
Phoenix 3D *(3D graphics)*. . . . . 65.
Dubl-Click Software ... NCP
World-Class Fonts! Vol. One or Vol. Two . . . . 29.
Calculator Construction Set. . . . . 39.
EDO Communications ... CP
Laserworks *(requires 512k, Laserwriter)* . . . 229.
Electronic Arts ... CP
Deluxe Music Construction Set . . . . . 32.
Enabling Technologies ... NCP
Easy3D *(create solid 3D objects)*. . . . . 79.
Enterset ... NCP
Quickset *(icon-driven desk accessories)* . . . 27.
Quickword *(word processing tool)* . . . . . 32.
MacGAS *(spell checker, 512k, ext. drive)* . . . 55.
1st Byte ... CP
First Shapes *(preschool learning tool)* . . . . . 32.
Speller Bee, KidTalk, or Mathtalk . . . . . 42.
Smoothtalker *(speech synthesis)* . . . . . 52.
Forethought ... NCP
Factfinder *(free-form info organizer)* . . . . . 49.
FileMaker *(custom forms & reports)* . . . . . 79.
FileMaker Plus *(feature-packed database)* 159.
Fortnum/Southern
MacInooga Choo-Choo *(512k, NCP)* . . . . . 21.
MacChemistry *(CP)* . . . . . 89.
FWB Software ... NCP
Hard Disk Backup *(protect hard disk info)* . . 39.
Hard Disk Partition *(speeds up hard disk)* . . 39.
Hard Disk Util *(program backup)*. . . . . 59.
Great Wave Software ... NCP
KidsTime *(educational, ages 3-8)* . . . . . 29.
LOC *(strategy game)* . . . . . 29.
ConcertWare+ *(music composition)* . . . . . 29.
ConcertWare+ MIDI. . . . . 75.
Greene, Johnson ... CP
Spellswell *(spelling checker)* . . . . . 45.
Hayden Software ... CP
I Know It's Here Somewhere *(handy filer)*. . . 20.
Hayden:Speller *(for Word & MacWrite)*. . . . . 27.
MusicWorks *(songs for your Mac)* . . . . . 32.
DaVinci Building Blocks *(NCP)* . . . . . 46.
Home Design *(NCP)*. . . . . 49.
Score Improvement System for the SAT . . . . 59.
VideoWorks & MusicWorks Bundle . . . . . 59.
DaVinci Commercial Interiors *(NCP)*. . . . . 114.
Ideaform ... CP
MacLabeler *(print disk labels)* . . . . . 29.
Imagine ... NCP
Smart Alarms *(DA reminder system)* . . . . . 39.
Impulse ... NCP
Comic Strip Factory . . . . . 65.
Industrial Computations ... NCP
Powermath *(equation solving tool)*. . . . . 52.
Infosphere ... CP
LaserServe *(network software)*. . . . . 125.
MacServe *(network software)* . . . . . 250.
Innovative Data Design ... NCP
Paste-Ease *(requires Paint program)* . . . . . 35.
MacDraft *(new updated version, 512k)*. . . . 179.
Kensington ... NCP
Graphic Accents *(req. Paint program)* . . . . . 29.
Type Fonts for Text *(16 new fonts)*. . . . . 29.
Type Fonts for Headlines *(req. 512k)* . . . . . 42.
Layered ... CP
Notes...For Excel . . . . . 42.
Front Desk . . . . . 75.
Legisoft/Nolo Press ... NCP
WillWriter 2.0 *(prepare your own will)* . . . . . $32.
Linguist's Software ... NCP
Tech *(1000 different symbols)* . . . . . 59.
FOREIGN LANGUAGE FONTS
MacCyrillic. . . . . 39.
SuperFrench/German/Spanish . . . . . 39.
MacHieroglyphics, MacKana/Basic Kanji, MacSemitic/Coptic/Devanagari, MacKorean, MacArabic, MacGreek, MacHebrew *each* 59.
SuperGreek New Testament . . . . . 79.
LaserFrench/Greek/German/Spanish . . . . 79.
MacGreek/Hebrew/Phonetics . . . . . 89.
Living Videotext ... NCP
ThinkTank 512k *(outline processor)* . . . . . 99.
More *(outlines, windows, & tree charts)* . . 159.
MacMemory ... NCP
MaxRam & MaxPrint *(Ramdisk, spooler)* . . 39.
MacroMind ... NCP
M.U.D. *(Art Grabber+, CheapPaint)*. . . . . 32.
Magnum ... NCP
Natural Sound Effects . . . . . 27.
Natural Sound Cable & Editor Disk . . . . . 89.
McPic - Volume 1 or Volume 2 . . . . . 29.
The Slide Show Magician 1.3 *(CP)* . . . . . 35.
Manhattan Graphics ... NCP
Desk Design *(2 volume set)* . . . . . 37.
Ready,Set,Go!3 *(desktop publishing)*. . . . 175.
Microsoft
Flight Simulator *(the Mac takes flight, CP)* 33.
Learning Multiplan and Chart *(2 disks, CP)* 39.
Basic 3.0 *(Basic interpreter, NCP)* . . . . . 59.
Chart 1.0 *(42 chart styles, CP)* . . . . . 72.
Multiplan 1.1 *(63 col. by 255 rows, CP)*. . . 105.
File 1.04 *(flexible data manager, NCP)* . . . 111.
Word 1.05 *(word processor, CP)* . . . . . 111.
Fortran 2.2 *(compiler, NCP)* . . . . . 169.
Works 1.0 *(integrated tool, NCP)* . . . . . 189.
Excel 1.03 *(power spreadsheet, NCP)* . . . 225.
Miles Computing ... NCP
Mac the Ripper *(req. Paint program)* . . . . . 27.
Mindscape ... CP
The Luscher Profile *(personality profile)* . . . 24.
The Perfect Score: SAT. . . . . 47.
ComicWorks *(create your own comics)*. . . . 49.
GraphicWorks *(newsletters, ads, posters)* 49.
Monogram ... NCP
Forecast *(tax planning)* . . . . . 41.
Dollars & Sense *(home, small business)* . . . 81.
Nevins Microsystems ... NCP
Turbocharger *(disk cache, req. 512k)*. . . . . 39.
New Canaan MicroCode ... NCP
MDCFinder *(requires 512k)* . . . . . 20.
Mac Disk Catalog II *(requires 512k)* . . . . . 32.
Odesta ... NCP
Helix *(req. 512k, external drive)* . . . . . 105.
Double Helix *(relational, custom menus)* 289.
Palantir ... CP
MacType, MathFlash or WordPlay . . . . . 26.
Inventory Control, GL, or AR . . . . . .*each* 69.
inTalk *(communication to emulation)* . . . . . 79.
PBI Software ... NCP
Icon Switcher *(customized icons)*. . . . . 14.
Icon Fun & Games or Business Libraries . . 14.
HFS Locater *(DA organizer for HFS)*. . . . . 27.
Hard Disk Backup *(supports MFS, HFS)* . . 29.
Peachtree ... CP
Back to Basics GL, AP, or AR . . . . . *each* 89.
Personal Computer Peripherals ... NCP
HFS Backup . . . . . 39.

Holy Icons!



The monks at Saiva Siddhanta Church Monastery meditated long and hard before selecting the perfect micro.

Contest Winner #3

Name: Hinduism Today, Hanamaulu, Hawaii.
System: An eight Mac Plus system with a Hayes InterBridge and a whole lot more.
Applications: Publishing and beekeeping.

The true soul of a new machine.

Did you know that one out of every six people on this planet is Hindu? Or, that it's the world's oldest faith? Or, that there's an 8-year-old bi-monthly international Hindu newspaper which is written, edited, designed, and typeset on an 8-Mac Plus network, two 40MB Bernoullis, an Abaton 300 dpi scanner, LaserWriter Plus, two Imagewriters, and assorted software?

Are we going too fast for you? Is the vision of the world's oldest religion merging with the world's newest technology too much to handle? Ah, the dharma sure do its thing in mysterious ways, no? Score one for Shiva.

Hawaii Five-Om.

This Macintosh marvel – one of the first systems of its kind anywhere in the world – is located on the paradisial Hawaiian island of Kauai, where you'll find the editorial and production offices of *Hinduism Today*.

The monks also run the Wailua Farm and Apiary. That's right, apiary. You see, they raise a few bees there. Just 200,000,000 or so. Their honey is used exclusively by all the commercial bakers in Hawaii.

How, you may ask, do they keep track of all these bees? One guess. They use their Macs to make harvest projections, schedule crews, keep track of genetics (wouldn't want a drone to be Queen For A Day), plot their 80 different sites, pay bills, design labels, and log notes about weather, pollen, and production.

So maybe you don't wear orange robes and use one of the most sophisticated Mac setups in the world. You may still have an intriguing enough story to win $500 in Mac add-ons and software. Write us soon!

"Our Connection."

MacConnection

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to our customers a

Polarware ... CP
Graphics Magician *(animation)* . . . . . $39.
ProVUE Development ... NCP
OverVUE 2.0 *(power-packed database)* . . . 149.
Mail Manager Template . . . . . 29.
Personal Finance Template . . . . . 29.
QED Information Sciences ... CP
Typing Made Easy *(instruction)* . . . . . 35.
Rubicon Publishing ... CP
Silver Palate Collection *(NY's finest!)* . . . . . 29.
Dinner At Eight *(recipes to wines)* . . . . . 35.
Dinner At Eight-Silver Palate Bundle . . . . . 59.
Satori ... NCP
BulkMailer *(mailing lists)* . . . . . 75.
Sierra On-Line ... CP
MacOneWrite CD, AR, or GL. . . . . *each* 79.
Silicon Beach Software ... NCP
Accessory Pak 1 *(useful utilities)* . . . . . 21.
Silicon Press *(printer utility, 512k)* . . . . . 42.
SuperPaint *(advanced graphics program)* 59.
Simon & Schuster ... NCP
Mac Art Department *(req. Paint program)* 24.
Paper Airplane Construction Kit. . . . . 24.
Typing Tutor III *(learn to type!)* . . . . . 35.
SoftStyle ... NCP
Colormate Art *(Colormate images)* . . . . . 29.
Colormate *(color printing utility)* . . . . . 49.
Laserstart *(Hewlett-Packard Laserjet)* . . . . . 59.
Decision Map *(make better decisions, CP)* 85.
Software Discoveries ... NCP
Record Holder *(data manager)* . . . . . 45.
Software Ventures ... NCP
Microphone *(communications)* . . . . . 65.
Solutions, Inc. ... NCP
Glue *(creates "print to disk" capability)* . . . 35.
Springboard
Art a la Mac Vol. 1-People & Places *(NCP)* 23.
Art a la Mac Vol. 2-Variety Pack *(NCP)* . . . . 23.
Easy as ABC *(ages 3-6, letters, CP)* . . . . . 29.
Early Games *(ages 2-6, counting, CP)* . . . . 29.
State of the Art ... CP
Electric Checkbook *(print checks)* . . . . . 29.
Survivor Software ... NCP
MacMoney *(financial planner)* . . . . . 49.
Symmetry ... NCP
Acta *(outline/writing desk accessory)* . . . . . 39.
PictureBase *(clip art manager, 512k)* . . . . . 45.
T/Maker ... NCP
ClickArt Personal Graphics, Effects . . . .*each* 29.
ClickArt Letters, Publications . . . . . .*each* 29.
ClickArt Holidays *(Valentine's Day, Easter)* . . 29.
Write Now *(word processor)* . . . . . 119.
Target Software ... NCP
Merriam Webster's Thesaurus . . . . . 29.
MacLightning *(interactive spell checker)* . . 53.
Medical or Legal Dictionary . . . . . 53.

MacConnection Special of the Month
through February 28, 1987

ERGOTRON
MacBuffer
The print buffer solution for your Mac. No need to wait for your printer. MacBuffer transfers data and frees you and your Mac for other tasks. Available in either 512k or one Megabyte of memory.

- Two Macs can share MacBuffer & printer
- Local copy & single sheet modes
- Comes complete with all cables

MacBuffer 512k . . . . . $359.
MacBuffer 1024k . . . . . $549.

Telos Software ... CP
Business Filevision *(512k, external drive)* 199.
Think Educational ... CP
MacEdge II *(math & reading)* . . . . . 28.
Mind Over Mac *(5 challenging games)* . . . 28.
Think Technologies ... CP
Lightspeed Pascal *(includes debugger)* . . . 89.
Lightspeed C *(top-rated C Compiler)* . . . . 129.
TML Systems ... NCP
TML Source Code Library . . . . . 59.
TML Pascal *(compiler, req. 512k)* . . . . . 69.
TrueBasic ... NCP
True BASIC *(fast, flexible & portable)* . . . . . 89.
Algebra, Pre-calculus, Calculus, Trigonometry, 3D Graphics, Discrete Math, Probability & Chippendale utilities . . . . . .*each* 36.
TrueSTAT *(statistics)* . . . . . 59.
Runtime *(create stand-alone applications)* 59.
Unicorn ... CP
Animal Kingdom *(ages 6-12)* . . . . . 29.
Decimal Dungeon *(math, ages 9 and up)* . . 29.
Fraction Action *(arcade style math game)* . 29.
Mac Robots *(pre-school program)* . . . . . 29.
Math Wizard *(math games, ages 5-10)* . . . . 29.
Read-A-Rama *(reading, ages 5-8)* . . . . . 35.
William & Macias ... NCP
myDiskLabeler *(design & print labels)* . . . . 25.
myDiskLabeler w/Color *(req. Imagewriter II)* 34.
myDiskLabeler w/Laserwriter option . . . . . 39.

GAMES

Accolade ... CP
Hardball *(baseball simulation)* . . . . . 27.
Activision ... CP
Hacker *(you're on your own!)* . . . . . 27.
Hacker II *(breach Russian computer)* . . . . . 30.
Mind Shadow *(Who am I?)* . . . . . $27.
Borrowed Time *(murder mystery)* . . . . . 27.
Shanghai *(Mah Jongg strategy)* . . . . . 27.
Alter Ego *(male or female version)* . . . . . 36.
Ann Arbor Softworks ... CP
Grid Wars *(3D graphic arcade)* . . . . . 22.
Artworx ... CP
Bridge 4.0 *(sharpen your skills)* . . . . . 21.
Avalon Hill ... CP
MacPro Football *(req. 512k)* . . . . . 32.
Blue Chip ... CP
Millionaire *(stock market)* . . . . . 35.
Tycoon *(commodities)* . . . . . 35.
Baron *(real estate)* . . . . . 35.
Squire *(personal finance, req. 512k)* . . . . . 35.
Broderbund Software ... CP
Lode Runner *(over 150 levels)* . . . . . 24.
Ancient Art of War *(military strategy)* . . . . . 27.
Toy Shop *(create working models)* . . . . . 39.
Bullseye ... CP
Ferrari Grand Prix *(Formula One racing)* . . . 35.
Fokker TriPlane Flight Simulator . . . . . 35.
Electronic Arts ... CP
Archon *(arcade strategy, req. 512k)* . . . . . 27.
Skyfox *(3D graphics)* . . . . . 27.
One on One/Dr J vs Larry Bird *(req. 512k)* . . 27.
Patton-vs-Rommel *(req. 512k)* . . . . . 27.
Pinball Construction Set. . . . . 27.
Epyx ... CP
Rogue *(strategy dungeon classic!)* . . . . . 24.
Temple of Apshai *(4 levels)* . . . . . 24.
Winter Games *(Olympic events)* . . . . . 24.
Hayden Software ... CP
Perplexx *(scrabble-type game)* . . . . . 24.
Sargon III *(9 levels of chess)* . . . . . 29.
Infinity Software ... CP
Grand Slam *(tennis, req. 512k)* . . . . . 28.
Infocom ... CP
Leather Goddesses of Phobos, Moonmist, Ballyhoo, Cutthroats, Hitchhiker's Guide, Planetfall, Wishbringer, Enchanter, Trinity, Zork 1, The Witness *(standard)* . . . . . *each* 24.
Zork II, Zork III, Sorcerer, Suspect, Mind Forever Voyaging *(advanced)* *each* 26.
Spellbreaker *(expert)* . . . . . 29.
Invisiclues *(hint booklets)* . . . . . .*each* 6.
MacroMind ... NCP
Maze Wars+ *(play via modem or network)* 32.
Miles Computing ... CP
Fusillade *(arcade maze)* . . . . . 21.
MacAttack *(3D tank simulation)* . . . . . 27.
Harrier Strike Mission *(3D flight simulation)* 27.
MacWars *(3D space simulation)* . . . . . 27.
Mindscape ... CP
Rambo: First Blood Part II . . . . . 24.
James Bond 007: "A View to a Kill" . . . . . 24.

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*Defective software replaced immediately. Defective hardware replaced or repaired at our discretion. Some items have warranties up to five years.

nd their Macs.

James Bond 007: "Goldfinger" . . . . . $24.
Stephen King's "The Mist" . . . . . 24.
Racter *(converse with your Mac!)* . . . . . 27.
Balance of Power *(world politics)* . . . . . 30.
King of Chicago *(murder mystery)* . . . . . 30.
Brataccus *(great graphics, req. 512k)* . . . . 30.
Uninvited *(mystery adventure)* . . . . . 30.
Deja Vu *(murder mystery)* . . . . . 33.

Origin Systems ... CP
Exodus: Ultima III *(fantasy adventure)* . . . . 38.

PBI Software ... CP
Strategic Conquest *(multi-user)* . . . . . 35.

Polarware ... CP
Crimson Crown . . . . . 15.

Psion ... CP
Psion Chess *(3D and multi-lingual)* . . . . . 31.

QWare ... CP
Orb Quest *(graphic fantasy adventure)* . . . 29.

Scarborough ... CP
Make Millions *(business simulation)* . . . . . 29.

Sierra On-Line ... CP
Championship Boxing *(knock 'em out!)* . . . 25.
Ultima II *(role playing adventure)* . . . . . 25.

Silicon Beach Software
Airborne! *(CP)* . . . . . 20.
Enchanted Scepters *(CP)* . . . . . 21.
Dark Castle *(NCP)* . . . . . 28.
World Builder *(NCP)* . . . . . 42.

Simon & Schuster ... CP
Star Trek—The Kobayashi Adventure . . . . . 24.

Sir-Tech ... CP
Mac Wizardry *(high-rated fantasy)* . . . . . 36.

Spectrum Holobyte ... NCP
GATO *(submarine simulation)* . . . . . 26.
Orbiter *(space shuttle simulation)* . . . . . 27.
Tellstar II *(No. & So. hemispheres, req. 512k)* 45.

HARDWARE

Apricorn ... 1 year
ApriCord Mac *(Mac Plus parallel interface)* 75.

Cambridge Automation ... 90 days
MIDI Conductor . . . . . 69.

Curtis Manufacturing ... lifetime
Diamond *(6 outlets)* . . . . . 29.
Emerald *(6 outlets; 6 ft cord)* . . . . . 36.
Sapphire *(3 outlets; EMI/RFI filtered)* . . . . . 47.
Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* . 55.

Dove Computer ... 90 days
Memory Expansion Units
Mac Snap 524 *(512k to 1 Meg)* . . . . . 159.
Mac Snap Plus 2 *(Mac Plus to 2 Meg)* . . . 309.
Mac Snap 548 *(512k to 2 Meg)* . . . . . 469.

Ehman Engineering ... 1 year
800k External Disk Drive . . . . . 225.

Ergotron ... 1 year
MacTilt *(includes external drive bracket)* . . . 75.
MacBuffer 512k . . . . . special
MacBuffer 1024k . . . . . special

Hayes ... 2 years
Smartcom II *(communications software)* . . 89.
Smartmodem 1200 or 2400 . . . . . call
Smartmodem 1200 or 2400 package . . . . call

IOMEGA ... 90 days
Bernoulli Box *(dual 10 MB w/SCSI)* . . . . . 1869.
Bernoulli Box *(dual 10 MB, Appletalk)* . . . 2195.
Bernoulli Box *(dual 20 MB w/SCSI)* . . . . 2369.

Kensington ... 1 year
Mouseway *(mouse tracking pad)* . . . . . 8.
Mouse Pocket *(for your idle mouse)* . . . . . 8.
Mac (Plus), HD, System Saver Cover *each* 9.
Imagewriter (II) Dust Cover . . . . . $9.
AppleTalk Clips . . . . . 11.
Mouse Cleaning Kit w/Mouse Pocket . . . . . 17.
Disk Case *(holds 36 Mac disks)* . . . . . 19.
Disk Drive Cleaning Kit . . . . . 20.
Tilt/Swivel . . . . . 22.
Universal Copy Stand . . . . . 24.
Polarizing Filter . . . . . 34.
Surge Suppressor . . . . . 35.
A-B Box *(specify Mac or Mac Plus)* . . . . . 65.
Control Center . . . . . 65.
System Saver Mac *(complete with fan)* . . . . 65.

Koala Technologies ... 90 days
KAT Graphics Tablet . . . . . 139.
MacVision *(digitizer)* . . . . . 175.

Kraft ... 1 year
3 Button QuickStick . . . . . 49.

Mirror Technologies ... 1 year
FastPort *("SCSI" for your 512k Mac)* . . . . 139.
MagNet 20x *(w/MacServe)* . . . . . 849.
Magnum 20 Tape Backup . . . . . 929.
MagNet 30x *(w/MacServe)* . . . . . 995.
MagNet 40/40 *(40MB, 40MB tape)* . . . . 2695.

Personal Computer Peripherals ... 1 year
MacBottom Hard Disk 20MB *(SCSI)* . . . . 879.

Summagraphics ... 90 days
MacTablet 6" x 9" *(stylus driven)* . . . . . 299.
MacTablet 12" x 12" *(sketching)* . . . . . 399.

Systems Control ... 2 years
MacGard *(surge protection)* . . . . . 55.

Thunderware ... 90 days
Thunderscan *(high-resolution digitizer)* . . 175.
Power Port . . . . . 29.

Western Automation ... 1 year
DASCH RAMdisk 1000k . . . . . 349.
DASCH RAMdisk 2000k . . . . . 399.

DISKS

Single-sided Diskettes

Sony 3½" Disks *(box of 10)* . . . . . 16.
Verbatim 3½" Disks *(box of 10)* . . . . . 16.
MAXELL 3½" Disks *(box of 10)* . . . . . 16.
Fuji 3½" Disks *(box of 10)* . . . . . 16.
3M 3½" Disks *(box of 10)* . . . . . 18.

Double-sided Diskettes

Sony 3½" Double-sided Disks *(10)* . . . . . 25.
Verbatim 3½" Double-sided Disks *(10)* . . . 25.
MAXELL 3½" Double-sided Disks *(10)* . . . 25.
Fuji 3½" Double-sided Disks *(10)* . . . . . 25.
3M 3½" Double-sided Disks *(10)* . . . . . 26.

INFORMATION SERVICES

Compuserve
Compuserve Information Service . . . . . 24.

Dow Jones
Dow Jones News/Retrieval Membership Kit 24.

Source Telecomputing
The Source *(subscription & manual)* . . . . . 30.

ACCESSORIES

Automation Facilities
Floppiclene Drive Care Kit . . . . . 15.
Floppiclene Refill *(ten cleaning disks)* . . . . . 10.
MacPak Complete Care System . . . . . 29.

Clean Image Ribbon Co.
Clean Image Ribbon Kit . . . . . 12.

Computer Coverup
External Disk Drive Cover . . . . . $4.
Imagewriter (II) Cover . . . . . 8.
Mac (Plus) & Keyboard *(two covers)* . . . . . 10.

Diversions
Underware Ribbon *(iron-on black transfer)* . . 9.
Multi-color Transfer Ribbon . . . . . 19.
ColorPack *(includes Colorpens)* . . . . . 19.

Environmental Software Company
External Drive Cover *(400k or 800k)* . . . . . 7.
Imagewriter (II) Cover . . . . . 11.
Mac (Plus) & Keyboard Cover . . . . . 15.
Laserwriter Cover . . . . . 17.
Mac Plus & HD20 & Keyboard Cover . . . . . 18.

I/O Design
Imageware II *(Imagewriter II carry case)* . . . 59.
Macinware Plus *(Mac Plus carry case)* . . . . 69.

Innovative Concepts
Flip & File Micro *(holds 25 disks)* . . . . . 9.
Flip & File *(holds 40 disks)* . . . . . 18.

Innovative Technologies
The Pocket Pak *(holds 6 disks)* . . . . . 10.
The Easel *(holds 20 disks)* . . . . . 14.
The Disk Directory *(holds 32 disks)* . . . . . 18.
The Library *(carousel, holds 80 disks)* . . . . 29.

Kalmar Designs
Teakwood Roll-top Case *(holds 45 disks)* . . 15.
Teakwood Roll-top Case *(holds 90 disks)* . . 22.

Magnum
Mouse Mover *(let your mouse ride!)* . . . . . 14.

Moustrak
Moustrak Pad *(standard 7" x 9")* . . . . . 8.
Moustrak Pad *(large 9" x 11")* . . . . . 9.

Ribbons Unlimited
Imagewriter Color Ribbons . . . . . 5.
Imagewriter Ribbons Six Pack . . . . . 25.
Imagewriter Rainbow Six Pack . . . . . 25.

Smith & Bellows
Mahogany Disk Case *(holds 90 disks)* . . . . 28.
Mac Plus Pack *(covers & disk case)* . . . . . 39.

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Font Facts

A comprehensive hands-on guide to working with fonts

by Erfert Nielson

New York, Monaco, Geneva. For most people, these names evoke images of glamour and sophistication. For Macintosh owners, however, the names are apt to conjure up images of a smaller world: the Font menu. Although it seems provincial compared to the wide world of typographic fonts, the microcosm of Macintosh fonts is rapidly becoming more cosmopolitan. At last count, more than 1500 fonts were available for the Mac.

Many Mac users are content with Apple's standard fonts; they're readable, both on screen and on paper, and require no installation. But as you'll see, installing fonts for printing on either the ImageWriter or the LaserWriter is surprisingly simple. If you want to make your correspondence more distinctive, need to add eye-catching display type to a laser-printed ad, or have specialized needs such as mathematical symbols or foreign-language alphabets, you should examine the possibilities presented by Macintosh fonts.

Fonts and Families

First, a few definitions are in order. In the world of traditional typography, a *font* is a complete set of characters in a particular size and typeface. Typefaces (Helvetica or Times, for example) are grouped into *families* that comprise a basic stylistic foundation with varying attributes such as character weight (thin, medium, bold), character width (condensed or extended), and style (roman, italic, or oblique). The Helvetica family, then, could include Helvetica Bold, Helvetica Bold Italic, and so on.

The word *font* is used somewhat more broadly in Macintosh terminology. For example, the names in *MacWrite*'s Font menu refer to a particular typeface, such as Geneva or Chicago; you select attributes such as size, style, and weight in the Style menu. The original LaserWriter's 13 built-in "fonts" (including roman, italic, oblique, and bold roman, bold italic, and bold oblique) are actually members of three typeface families—Helvetica, Times, and Courier—plus a special Symbols font. And the 35 fonts built into the LaserWriter Plus represent eight additional families from Adobe, plus the original four. (See "A Face for All Seasons," *Macworld,* February 1985, and "Putting On a Good Face," *Macworld,* July 1986, for more extensive discussions of font terminology.)

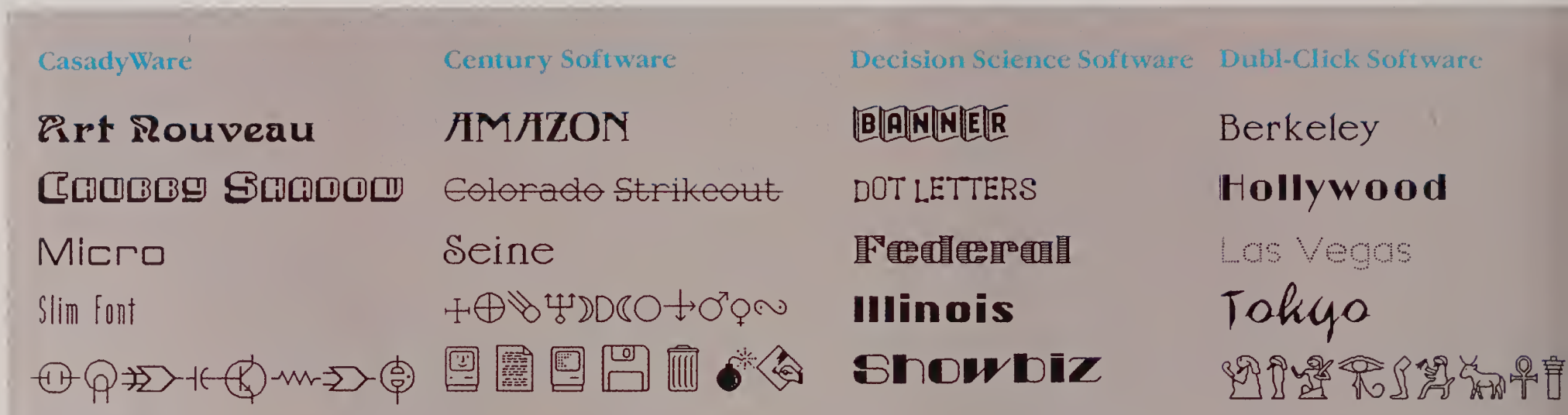
Bit-Mapped Fonts

Macintosh fonts can be divided into two basic categories: bit-mapped and laser. *Bit-mapped fonts,* like those you see displayed on the screen or printed on the ImageWriter, are made up of patterns of dots. The Mac screen displays characters at a resolution of 72 dots per inch (dpi). When printed on the ImageWriter, text closely matches what you see on screen, although the ImageWriter's resolution—160 dpi horizontally and 144 dpi vertically—is actually finer than the Mac's screen resolution.

Since each character consists of a "map" of dots, a version of a bit-mapped font must be created for each available size. The Geneva font, for example, is available in 9- and 12-point sizes. Although you can select a block of Geneva and display or print it in, say, 14-point, the characters will look ragged and uneven because no 14-point version of that font was created by Apple. You can tell what sizes are available for a given font by selecting the font from an application's Font menu, then looking at the associated point sizes, usually found in the Style menu. If a size is outlined in the Style menu (as opposed to displayed in plain black letters), the selected font is designed to be printed at that size. Word processing programs generally accommodate font sizes of up to 24 points, while some graphics programs, such as *FullPaint* and *SuperPaint,* allow you to manually enter point sizes from 1 to 127 points (however, most bit-mapped fonts don't look their best at extremely large or small sizes).

Bit-mapped fonts can be printed on the LaserWriter, but they don't take advantage of the printer's 300-dpi resolution. Nevertheless, laser-printed bit-mapped fonts look far superior to ImageWriter-printed fonts. Although characters are sent to the LaserWriter in 72-dpi format, the LaserWriter's smoothing algorithm softens the jagged edges, usually producing attractive text.

Bit-mapped fonts run the gamut from typewriter-like text to Egyptian hieroglyphics. In addition to text fonts, many companies offer novel or decorative fonts designed to be used as *display type:* eye-catching letters suitable for headlines or short phrases. Among the companies that offer collections of bit-mapped fonts are CasadyWare, Century Software, Kensington Microware, and Dubl-Click Software. Many excellent fonts are also distributed as shareware and public-domain software through on-line services and user groups; one of the most attractive Macintosh fonts, Boston II, is offered for $10.50 as shareware. See Figure 1 for a representative sample of bit-mapped fonts.



A number of companies also offer foreign-language fonts, symbol fonts, and other specialized character sets. If you're looking for Arabic, Greek, Hebrew, or Cyrillic, fonts for the Mac abound. Or if you've been frustrated by the standard Mac fonts' lack of fractions, alternatives exist: Boston II provides 4 common fractions, while Paragon Courseware's *SciFonts* offers 14. See Table 1 for a rundown of some of the specialized fonts currently available.

Installing Bit-Mapped Fonts

You use Apple's Font/DA Mover to install bit-mapped fonts into a disk's System, whether a hard disk or a floppy disk. When you double-click the Font/DA Mover icon, a dialog box containing two scroll boxes appears. The left-hand box lists the fonts that are currently installed in a disk's System file (see Figure 2). Insert another disk and click the Open button below the right-hand scroll box to view the contents of the second disk. Click on a font name and the Font/DA Mover displays how much memory the font occupies, as well as a sample phrase written in the selected font. Use the appropriate buttons to delete fonts from a System file or to copy fonts from one disk to another. The Font/DA Mover keeps a running total of how much space is free on each disk, allowing you to calculate whether you have room to install a font (see "On the Move" for tips on using the Font/DA Mover).

A floppy disk is usually adequate for storing a good number of bit-mapped fonts; a font available in four point sizes typically occupies 25 to 30K of memory. Since the new 128K ROMs provide scrolling menus, a Mac Plus or 512K Enhanced equipped with a hard disk should allow you to install all the fonts you'll need. In theory, up to 200 fonts (in this case, typefaces of a particular point size, such as New York 10 and New York 12) can be installed in a System Folder.

The Font/DA Mover allows you to customize your font collection, selectively adding or deleting fonts until you have a mix of styles and sizes to suit your needs.

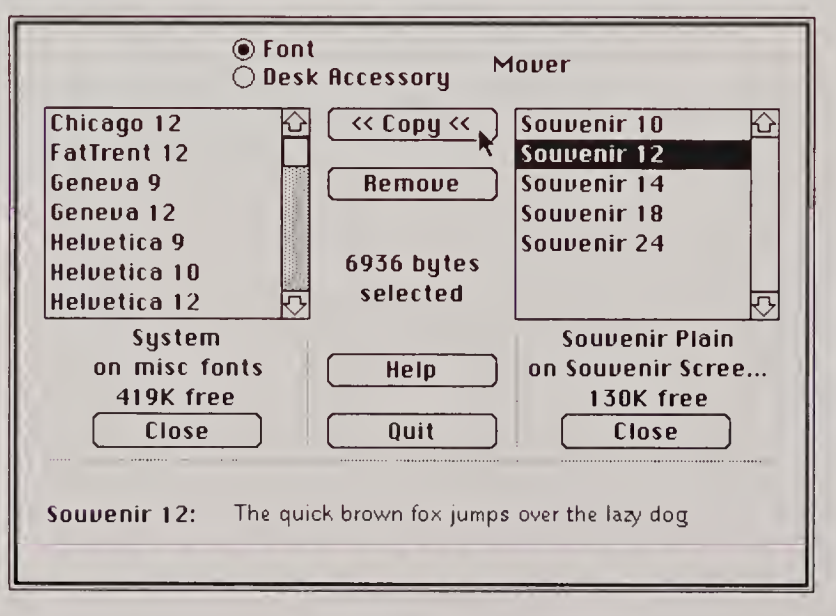


Figure 2
Apple's Font/DA Mover allows you to selectively add or delete bit-mapped fonts in a variety of sizes. The fonts are installed in a System file and appear in the Font menu of any application opened with that System.

But this utility doesn't allow you to modify the fonts themselves. To edit individual characters of a bit-mapped font, you need a program such as Apple's *ResEdit* (Resource Editor) or Altsys's *Fontastic*. (See "The Mac Font Shuffle," *Macworld,* December 1985, and "A Font of One's Own," *Macworld,* February 1986, for information on editing and creating fonts with *Fontastic*. See "Mining the Mac's Hidden Resources," *Macworld,* July 1985, for a description of *ResEdit*.) Both of these utilities are handy for modifying existing fonts and can even be used for creating your own fonts. But keep in mind that font design is an art; don't expect to turn out professional-looking fonts in a few hours.

Laser Fonts

Laser fonts are produced in an entirely different fashion than bit-mapped fonts. The characters of a laser typeface are made up of instructions that describe the curves and lines that comprise a character's outline. The instructions are written in Adobe Systems' PostScript, a page-description language that treats text as a graphic image that can be scaled to virtually any size while maintaining its proportions. Unlike bit-mapped fonts, PostScript fonts need only be stored in one size; the computer in the LaserWriter scales the character outlines, fills in the outlined area where appropriate, converts the characters to bit maps, and stores the information in a portion of its RAM. An entire page of text and graphics is assembled bit by bit in RAM and then printed.

Not all programs support laser fonts. A graphics application such as *MacPaint,* for example, records characters as bit maps and prints them as such. If you want to

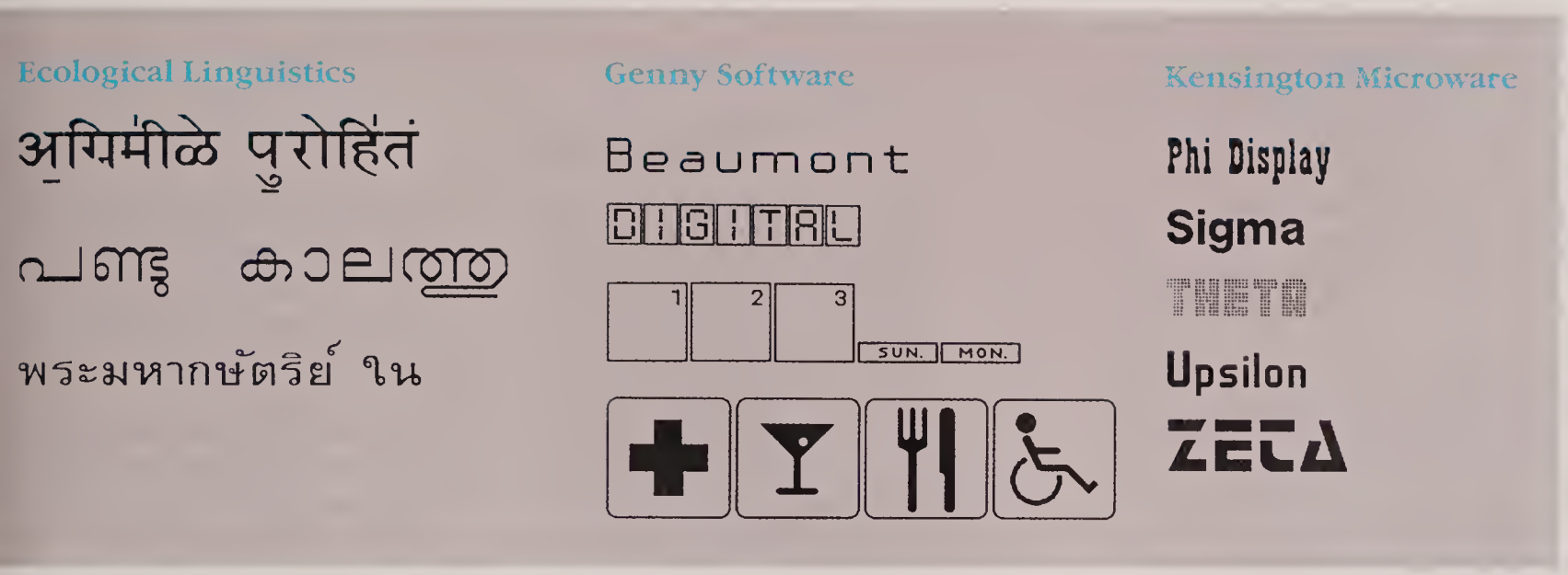


Figure 1
Here's a small sample of the types of bit-mapped fonts you can install on the Macintosh. Hundreds of bit-mapped fonts are available, both commercially and in the public domain.

Allotype Typographics Greek, Polish, scientific, chemical structures (laser fonts).
Boston II leading adjustment, subscripts and superscripts, 1-pixel horizontal spacing, fractions.
CasadyWare Cyrillic, Hebrew, Polish, Greek, circuit design, mathematical, architectural, strike-through, 4-point fonts.
Century Software Greek, math and engineering, chess, astrology, borders, accents, Mac icons.
Dubl-Click Greek, Hebrew, Russian, Japanese, chess, borders, architectural, Egyptian hieroglyphics.
Ecological Linguistics Armenian, Bengali, Cambodian, Georgian, Greek, Gujarati, Gurmukhi, Hindi/Sanskrit, Kannada, Laotian, Cyrillic, sign language, Slavic Latin, Tamil, Teluga, Thai.
Genny Software rulers, borders, calendar, keyboard, charts, international symbols, forms.
HebreWriter/Graphics Hebrew.
Linguists' Software Arabic, Hebrew, Greek, Hindi/Sanskrit, Egyptian hieroglyphics.
Modern Graphics chemical structures.
Paragon Courseware math, scientific.
Qualitas Trading Company Japanese (hirakana).
SMK Greek.

Table 1
From Sanskrit to mathematical symbols, Macintosh font developers offer an array of specialized fonts. Foreign-language fonts vary in style and quality, so look at a sample if possible before making a purchase.

combine *MacPaint* graphics with laser-printed fonts, you have to paste the graphics into a program that supports laser fonts, such as *MacWrite, PageMaker,* or *MacDraw.*

If you have access to a LaserWriter, by all means take advantage of the many laser fonts now available on the Mac. (The term *laser fonts* is slightly misleading, since these fonts can be printed on PostScript-driven devices other than the LaserWriter, including typesetting equipment with resolutions of up to 2540 dots per inch. For the purposes of this discussion, however, fonts generated in PostScript will be referred to as laser fonts.) The Mac's laser fonts can be grouped into two categories: built-in and downloadable. The LaserWriter Plus has 35 *built-in* fonts that reside permanently in its ROM. These fonts were developed by Adobe Systems, and many are based on typefaces from the well-known Mergenthaler and International Typeface Corporation (ITC) libraries. The LaserWriter's built-in fonts include typefaces that are generally suitable for both text and headlines.

Downloadable Fonts

If you desire more exotic fare, such as script, calligraphy, or decorative fonts, or if you simply want a greater variety of text faces, you should examine the wide array of downloadable fonts offered by a number of manufacturers. A *downloadable* font is sent by the LaserWriter Driver software to the LaserWriter's RAM, where it stays until a printing job is finished or until the printer is turned off.

Fonts can be loaded manually or automatically. Manually loading a font involves using a special program to send PostScript commands to the LaserWriter's RAM before printing a document. Manually loaded fonts remain in the LaserWriter's memory until the printer is turned off. It's easier to let an application automatically download fonts. When the application needs a font not already in the LaserWriter's memory, it searches the System file or other locations on disk and downloads the font when it's located. Fonts downloaded in this way are flushed from memory after a document is printed, making room for other fonts.

PageMaker's automatic downloading technique differs somewhat from that of other applications; the program downloads fonts while printing a text block (usually a full column of text), rather than downloading all the fonts for an entire document. Fonts are then flushed from memory and loaded for the next block.

Which method should you use? Because manually downloaded fonts remain in RAM, an application doesn't have to search for a font each time it's needed for printing. Therefore, manually downloaded fonts print faster than automatically downloaded ones. But because manually downloaded fonts are not cleared from memory after a document is printed, this technique restricts the number of fonts that can be used in a document.

It's up to you to decide which method is the most practical for your printing needs. If you use a single downloadable font throughout the day, for example, you may find it more efficient to manually download the font, keeping it available in the LaserWriter's memory at all times. You should manually download fonts if you use a print spooler; otherwise, fonts will be

flushed from memory before they're printed. On the other hand, you should not manually download fonts if you're sharing a LaserWriter with others on a network; if several people manually download fonts, rather than allowing applications to automatically shuffle them in and out of memory, the LaserWriter's RAM will quickly become overloaded.

Installing Laser Fonts

Like bit-mapped fonts, downloadable laser fonts must be installed before you can print them. Installing laser fonts is easy, especially if you opt to let your applications automatically download them as needed. While the installation procedure varies slightly from one font distributor to another, the general steps are described here.

Before jumping into an explanation of font installation, you should understand an important distinction: screen fonts versus printer fonts. *Screen fonts* are the characters that appear on screen when you type, in any application. Since you can't see the PostScript commands that make up a laser font, font developers must have some way of representing the font on screen. Screen fonts are simply bit-mapped fonts (like the ones discussed earlier) designed to approximate the look of the corresponding laser fonts.

Screen fonts are installed in an application's or hard disk's System with the Font/DA Mover, just as described earlier for bit-mapped fonts. You must install a screen font in order to print that font on the LaserWriter. (Most screen fonts are not intended to be printed on the ImageWriter; you can do so, of course, to proof a document or check a page layout, but the fonts generally don't look as good as bit-mapped fonts created specifically for printing on the ImageWriter.)

Installing printer fonts is equally straightforward. *Printer fonts* are files containing the PostScript commands that make up a character set. If you are using floppy disks, you can drag icons representing laser fonts into a disk's System Folder. If you have an external disk drive, you may want to place the printer font icons on a second floppy disk. On a hard disk with HFS, the printer fonts can be placed in the System Folder, the root directory, or an application's folder. Adobe's procedure for installing printer fonts, which involves an installation program that initializes fonts for use with a particular printer or printers, is slightly more complicated, but the steps are

Fontasia

It's impossible to anticipate all the problems that you may encounter when installing and using fonts, but with luck the following tips will address some common situations. Several items deal with memory management, an important consideration if you want to download more than a font or two at a time.

- When you place printer font icons in a disk's System Folder, *do not* rename the font icons or place them in their own folder within the System Folder. In either case, the System will not be able to locate the font files and download them to the LaserWriter.
- If you're printing a document at a copy shop or a similar service that rents a LaserWriter by the hour, be sure to bring your System, complete with the screen and printer fonts you've installed, with the document on disk. A copy shop or typesetting service will not necessarily have the same laser fonts you do.
- If you're printing documents with *PageMaker,* you don't need the Laser Prep file. *PageMaker* provides its own "prep" file, Aldus Prep, which performs the same function as Laser Prep. To make sure you don't load both Prep files into the LaserWriter's memory, you should do all your *PageMaker* printing first, then restart the LaserWriter and print from other applications.
- As described earlier, each laser printer font has a corresponding screen font, allowing you to achieve WYSIMOLWYG, or "what you see is more or less what you get." Screen fonts come in a variety of sizes, but you actually need to install only a single size of screen font for each printer font. If you don't mind a coarse screen display in other sizes, you could install only 12-point screen fonts, for example, saving a good deal of space in the System file.
- Occasionally a *MacWrite* document that prints out well on the ImageWriter prints on the LaserWriter with a tiny bit of the rightmost letters chopped off. Generally, the solution is simple: move the right-hand margin in *MacWrite* a tad to the left. If that doesn't work, make sure the text is formatted in a LaserWriter font such as Times or Helvetica, rather than a Macintosh System font such as New York or Geneva.
- Most of the time you can type text in a font that's easy to read on screen—Geneva, for example—and then select the text and change it to a more exotic font for laser printing. Beware, however, of those occasions when one font may not match another, character for character. Be especially wary of inadvertently changing Shift- or Option-key combinations. For an overview of the characters produced by each keystroke or keystroke combination, use the Key Caps desk accessory, which allows you to view any font that's installed.
- If you have a Mac with the old 64K ROM, you may encounter character-spacing problems if you select Bold or Italic from the Style menu rather than choosing the bold or italic version of a font from the Font menu. With the Mac Plus, it's generally OK to select these attributes from the Style menu, but results vary from font to font (for example, a true italic font may not exist in a particular family, in which case an *oblique,* or slanted, version of the font may appear when you select Italic). Your best bet for

finding out which method to use with a particular font is to try both approaches and compare the laser-printed results.

- If you have a substantial number of screen fonts installed in an application, you may have trouble remembering which of the font names refer to laser fonts and which to bit-mapped fonts. You can use Apple's *ResEdit* to mark laser fonts in the Font menu with a special symbol such as an asterisk.
- If you frequently use a particular font, you probably wish you could simply open up a document and type in that font, rather than having to switch from the Mac's default font, Geneva. A public-domain desk accessory called ApplFont lets you designate any font as the default font. ApplFont is available on CompuServe or through user groups.
- If you've installed laser fonts but the LaserWriter prints bit-mapped fonts, the problem could be due to one of a number of factors. For example, you may have used an old version of the Font/DA Mover (you need version 3.1 or later to properly install laser fonts). Or you may have changed the name of a printer font file or placed it in the wrong location—perhaps you even forgot to insert a disk containing the required printer fonts. If all the printing files seem to be correctly installed, you may have committed a more subtle error, such as inserting a disk containing printer fonts after opening the application you wish to print from. Check to see if any of these factors is the culprit.
- When you select Page Setup, you'll see a check-box labeled Font Substitution. If this option is checked, the LaserWriter replaces Macintosh bit-mapped fonts with an appropriate built-in laser font; Geneva becomes Helvetica, New York becomes Times, and Monaco changes to Courier. Font Substitution allows you to work in familiar screen fonts such as Geneva and New York but produces widely spaced characters when these fonts are printed. Therefore, you should switch to a LaserWriter font before printing the final version of a document.
- A surprising number of Macintosh users—even veterans—are unaware of a few keystroke combinations that can make documents more attractive. Shift-Option-hyphen produces a dash, which looks much better than twin hyphens. Combinations of Shift, Option, and the bracket keys produce "curly" quotation marks. Pressing Option-space bar or Option-hyphen produces a "hard" space or hyphen, respectively, to ensure that certain word combinations aren't split up by line breaks. Finally, to type an accented letter, simultaneously press Option and the appropriate accent key (look at the Key Caps desk accessory to find accents), release the two keys, and type the letter to be accented.
- Here's a tip for ImageWriter users. For satisfactory results when printing in Best quality, a disk's System file must contain a font not only in the size you're printing, but one of twice that size as well. This is because the ImageWriter doubles the font size, then scales it down, printing twice the number of dots per inch. This way, characters printed in Best mode appear darker and denser than characters printed as straight bit maps.

clearly outlined in the instruction manual. (See Figure 3 for an outline of the font-installation procedure.)

Load 'em Up

Once you've added screen fonts and printer fonts to a floppy or hard disk, you're ready to get down to downloading. Selecting laser fonts in a document is no different from selecting bit-mapped fonts; you simply drag the cursor across a section of text and select the desired font, style, and size from the appropriate menus. A screen font's name is linked to the corresponding printer font; when a screen font is selected, the appropriate printer font will be selected when the document is printed.

Although installing and selecting laser fonts is simple, laser printing involves a few considerations that don't apply to printing on the ImageWriter. A question commonly asked by beginning font-loaders is, Can I mix built-in and downloadable fonts when printing a document? The answer is an unequivocal yes.

Another frequently asked question is, How many downloadable fonts can I include in a single document? The answer to this question is not so straightforward. While the LaserWriter has 1.5 megabytes of RAM, very little of this memory is available for storing fonts. For example, the LaserWriter stores the image of an entire page before printing it; this alone takes up almost a megabyte of RAM. In addition, memory is consumed when the LaserWriter scales PostScript outlines and converts them to bit-mapped characters in preparation for printing. When the LaserWriter's computing tasks are added up, only 175K or so of RAM is left; but even this paltry amount of room must be shared with the Laser Prep file, which interprets PostScript commands.

As a general rule, you can include three or four downloadable fonts in a document. This limit varies, depending on factors such as the size of a font (a typical printer font occupies 30 to 60K) and the application you're using. The LaserWriter will let you know if you've overloaded its memory with an excess of fonts; either a message will inform you that you've loaded too many fonts for the printer to handle, or the LaserWriter will restart, clearing all downloaded fonts from RAM and spewing out a new test page.

Depending on how much memory is free and how much room is occupied by the fonts you're using, you may be able to print as many as six downloadable fonts in a document. As a test, I printed a four-page

Adobe

ITC American Typewriter

ITC Benguiat Book

ITC Garamond Light

ITC MACHINE

ITC Souvenir Light Italic

Optima Bold

Allotype Typographics

a b c ← ↓ √ Λ ∮ ± μ ≤ ≥ ↔

A B C D E A B C D E Â Ê Á È

ć ę ń ś Ż Ą Ś Î Ï Ø Ô Ò Ú

α β ψ δ ε A B Ψ Δ E ὸ ὗ ὼ

CasadyWare

Bodoni

Gregorian

Gatsby Light

MONTEREY

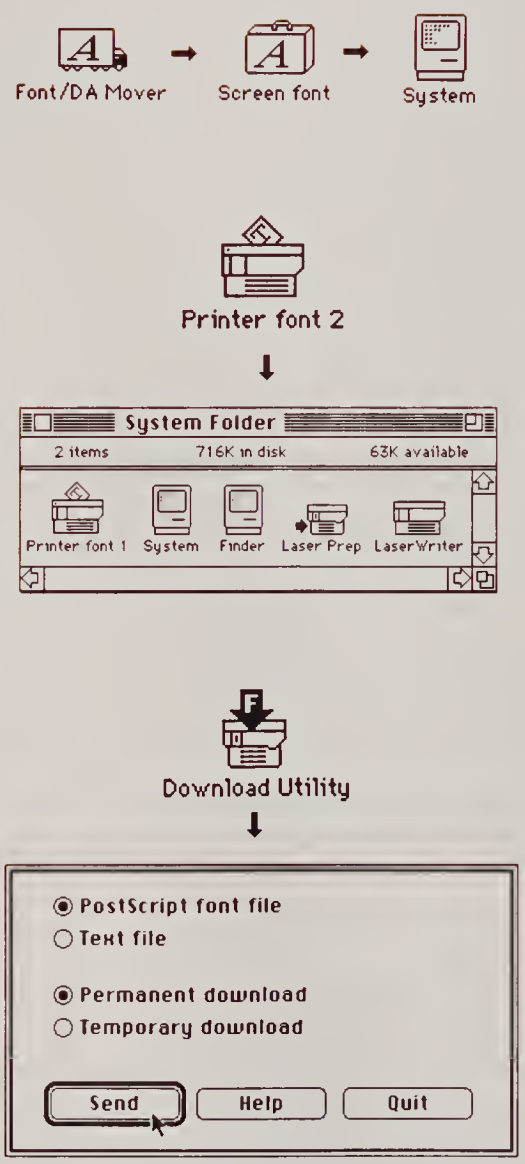
Regency Script

Zephyr Script

MacWrite document that included one built-in font and five downloaded fonts. The document printed successfully, although the Mac's screen displayed a warning that I was pushing the limits of the LaserWriter's memory. You'll have to experiment with your particular combination of fonts, applications, and hardware to find out how many fonts you can print in a given document.

It's small comfort to point out that it doesn't make good design sense to mix numerous typefaces in a document; unfortunately, in the area of LaserWriter memory allocation, not much comfort is available. *PageMaker* offers some relief. Because the program clears fonts from memory after each block of text, it can print four to six fonts per block and a virtually unlimited number of fonts per document.

Yet another common question is, What hardware do I need in order to use downloadable fonts? As with most current Mac software, you need at least a 512K Mac with an external drive to download fonts efficiently. Of course, a Mac Plus is better, and a hard disk is ideal. A Mac Plus is preferable to older Macs because the new ROM found in the Plus handles fonts more effectively than its predecessor. For example, the Mac Plus produces printed text with more even letter spacing than that produced by older Macs. There is little difference in performance between the original LaserWriter and the LaserWriter Plus. The LaserWriter Plus, although it contains additional built-in fonts in ROM, has no more RAM than the LaserWriter. The LaserWriter Plus does use RAM somewhat more efficiently, however, providing a little more room for fonts and printing faster than the LaserWriter.



Use Apple's Font/DA Mover to install screen fonts in the System file. When you use the System file to start up an application, the installed fonts will appear in the application's Font menu.

In order for laser fonts to be printed, they must be available to the LaserWriter. In most cases, you simply drag icons of fonts you wish to print—printer fonts—into the System Folder. If there's not enough room on your system disk, you can place printer fonts on a separate disk in the external drive. Make sure the LaserWriter and Laser Prep files are in the System Folder.

Manually downloading fonts causes them to print more quickly. Many laser font packages include a utility that enables you to manually download the fonts of your choice. A permanent download installs a font in the LaserWriter's RAM until the printer is turned off.

Figure 3
The basic steps involved in installing downloadable laser fonts are shown here. Procedures vary somewhat from company to company; the icons shown are from CasadyWare's Fluent Laser Fonts.

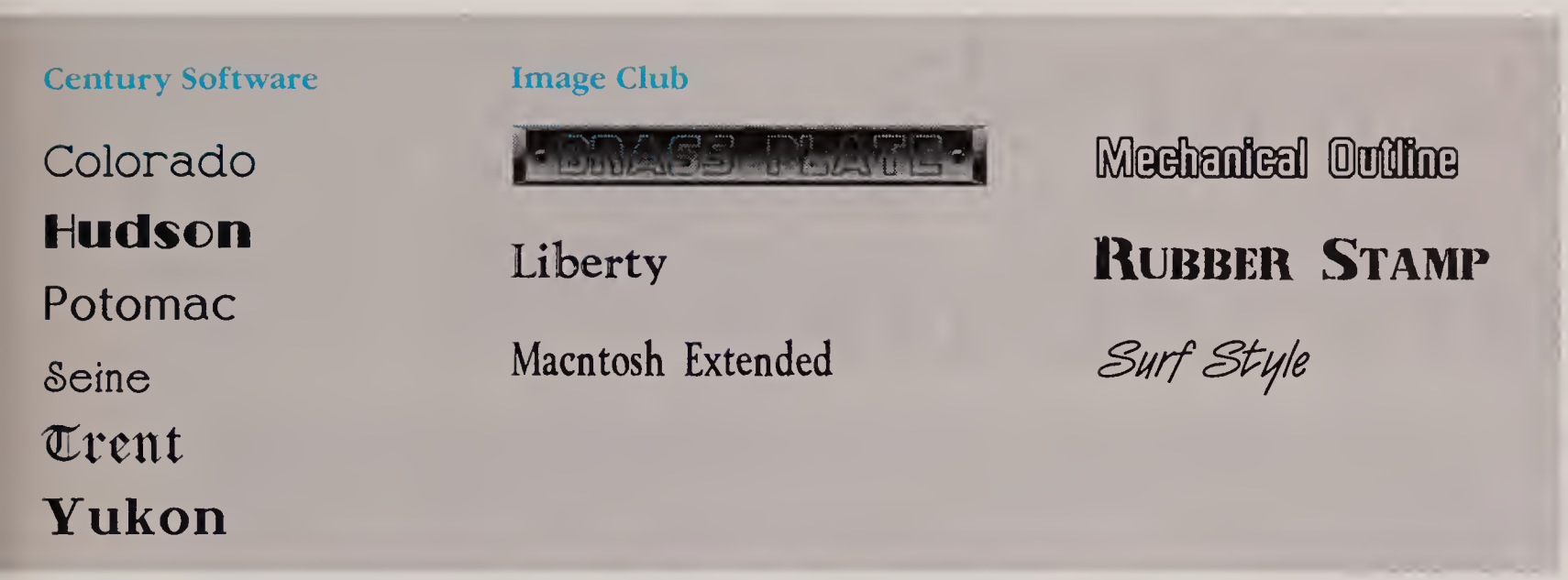


Figure 4
To give you an idea of the variety of styles that exist, sample laser fonts from several major developers are shown here.

On the Move

Like any good moving and storage company, Apple's Font/DA Mover takes care of packing, hauling, and delivering a font collection. But even experienced movers need some instructions from those using their services. The following advice will help you use the Font/DA Mover more efficiently.

- You can free up a good deal of memory in a System file by deleting unneeded fonts with the Font/DA Mover and then use the reclaimed space to install fonts of your choice. The disk space gained can be especially important if you're using floppy disks rather than a hard disk. Keep in mind that you can't delete the Geneva, Chicago, or Monaco fonts, which are used by the Mac's System.
- Unlike most Macintosh applications, the Font/DA Mover doesn't ask you to confirm your decision to delete a file, in this case a font. When you click the Remove button, the selected font is consigned to oblivion. To avoid embarrassing mistakes, such as permanently wiping out the only version of a font, you should work from backup copies of font disks.
- The Font/DA Mover allows you to select several fonts at once and delete or copy them in one fell swoop. To select more than one font, drag the pointer across a group of fonts in the scroll box, highlighting them all. Your subsequent action—copy or remove—will apply to the entire group.
- You can use the Font/DA Mover to install fonts in a specific application rather than in a System file. Hold down the Option key when you click the Open button below the right-hand scroll box, and applications and documents, instead of the System file, will appear. You might want to install a font in a specific application if that's the only program in which you're likely to use the font and you don't want to clutter up the menus of other applications opened with a System file.
- If you want to conserve disk space, the Font/DA Mover can be stored on a separate disk and summoned when needed. This 33K utility needn't be on your application disk at all times; you use it only when installing or removing fonts.

Shopping for Fonts

Companies that offer laser fonts include Adobe, Allotype Typographics, CasadyWare, Century Software, and Image Club (see Figure 4 for a sampling of laser fonts). A comprehensive reference for Macintosh laser fonts is MacTography's *LaserSampler II* catalog ($23.95), which provides printouts of popular laser fonts. MacTography offers updates to the catalog several times a year.

If you've looked at the wide array of downloadable laser fonts and still don't find the font you need, you might want to try your hand at fashioning your own characters. Two programs, *Fontographer* from Altsys and *LaserWorks* from EDO Communications, allow you to create outline fonts that can be downloaded to PostScript-driven devices such as the LaserWriter. (See *Macworld,* July 1986 and November 1986, for reviews of these programs.) The caveat given to would-be bit-map font designers also applies to these laser font-creation programs: font design is an intricate process. However, most people will find these products useful for creating individual characters or custom graphics.

Now you know the basics of installing both bit-mapped and laser fonts. While the font-downloading process itself is fairly straightforward, using fonts efficiently involves some subtleties. See "Fontasia" for a collection of tips on font use, as well as solutions to common problems encountered by first-time fontographers. Once you begin downloading fonts, it shouldn't take long to develop an efficient approach for your particular combination of hardware, applications, and fonts. □

See *Where to Buy* for product details.

Macintosh in Flatland

A preview of Dynamac—the first portable Mac

by Danny Goodman

Imagine having your own self-contained knowledge manipulator in a portable package the size and shape of an ordinary notebook. Suppose it had the capacity to store for later retrieval thousands of page-equivalents of reference materials, poems, letters, recipes, records, drawings, animations, musical scores, waveforms, dynamic simulations, and anything else you would like to remember and change.

That dreamy vision was written ten years ago by Xerox PARC's Alan Kay and Adele Goldberg, at a time when *personal computer* meant the original Apple II or the Commodore PET. The notebook-sized machine envisioned in the quote was Alan Kay's Dynabook, a computer virtually impossible to build at the time.

Today, computer hardware technology is catching up to Kay's dream, as flat-screen portable and laptop computers tempt active computer users whose creative and analytical needs often extend beyond the desktop. Portable computer models abound for the IBM PC-compatible world, including at least one model that emulates the high-powered AT. But until recently, the Macintosh has been a computer glued to the desktop.

Although it's true that the Mac is transportable—after all, it does have a built-in handle and even an Apple carrying case—it is nonetheless bulky and boxy. Thus, when third-party companies begin repackaging official Mac Plus components into more compact boxes with flat screens, the user community takes notice. Such is the case with several portable Macintoshes being readied for production. At this writing the Dynamac was the only unit available for a hands-on look, but Colby and Intelitec are also preparing portables (see "More Portable Macs").

Anatomy of a Portable

If we take the first part of the Dynamac's name as a reference to its Dynabook heritage, then the machine falls short for reasons of size and weight. But as for the second part of its name, the Dynamac is all Macintosh and then some. Its 3⅞- by 13⅞- by 15⅞-inch package contains almost everything you'd expect in a Mac Plus, with the addition of an optional built-in 300/1200-baud modem, an optional 20- or 40-megabyte hard disk, optional memory expansion up to 4 megabytes, video connectors for both the Big Picture large-screen display (from E-Machines) and a standard video projector, and connectors for an external numeric keypad and a detachable Mac keyboard. In other words, you can use the Dynamac both as a completely self-contained, toteable Macintosh and as the core unit for a large-screen, detached keyboard system at your regular workstation.

Dynamac is encased in rugged black plastic, which makes the yellow-orange electroluminescent (EL) flat-screen display stand out, just as a similar display does on the high-end, PC-compatible GridCase 3 portable. Inside are a genuine Macintosh Plus digital board (and, hence, all the rear panel connectors of the Plus); a Mac Plus keyboard sans numeric keypad; a double-sided, 800K disk drive; and a flat-panel display housed in a 2-inch-thick, flip-top keyboard cover. Because the EL display emits light (unlike light-reflecting liquid crystal displays), adjustment of the panel's display angle is less critical, and the Dynamac screen moves through an arc adequate to eliminate glare. Production models will have a nonglare finish on the display panel.

Screen Display and Keyboard

In the unit provided for this preview, the display produced the same 512- by 342-pixel image as the Macintosh cathode ray tube (CRT) screen. Production units will display a slightly larger area of 640 by 400 to allow bigger windows. The pixels are square, as they are on the Mac screen, so both graphics and text look just as crisp as on the Mac's tube. Unfortunately, the display has no contrast or brightness control. In a brightly lit room, the EL display is nowhere near as bright as the Mac's CRT, and at night in dim light (say, a hotel room), the display is almost too bright.

The screen has two other annoying features. First, it emits a high-pitched whine. I encountered this with the Grid portable, too, which suggests it may be an inherent drawback of electroluminescent displays. Second, horizontal black lines on the screen (such as the top and bottom



JEFFERY NEWBURY

More Portable Macs

Two other developers are repackaging the Mac Plus into portable units similar to the Dynamac. Intelitec's MX Plus includes 1 to 4 megabytes of RAM, two 800K drives, the Mac Plus keyboard, and an optional 20-megabyte internal drive. The screen is a 512- by 342-pixel liquid crystal display (LCD) with a backlighting option and an adjustable viewing angle.

The computer is housed in a 13- by 18- by 4½-inch aluminum attache-style case and weighs 15 to 25 pounds, depending on which options are included. About 9 pounds of the total weight can be taken up by an optional battery, which provides 6 to 10 hours of operation, depending on the options powered up. The unit includes an internal battery-charging system and has a solar charging option. In addition, the MX Plus can run off a 12-volt car battery. Other options include a built-in 300/1200-baud modem and a thermal printer. Like the Dynamac's, the price for the MX Plus ranges from $5000 to $7000, depending on options.



MX Plus
Intelitec's MX Plus houses the Mac in a sturdy attaché case with an LCD screen and two disk drives.

Colby System Corporation was awarded a federal government contract to supply 120 Lap-Macs to the National Oceanic and Atmospheric Administration in Seattle and the Army's Training Technology Agency in Fort Monroe, Virginia. Colby's Lap-Mac, like the others, comes with 1 to 4 megabytes of RAM, one or two 800K drives, and an optional 20-, 40-, or 60-megabyte removable internal hard disk. The Lap-Mac screen is a 12-inch plasma display with the same number of pixels as the Mac, but its active area is 20 percent larger.

The unit is 13 by 2½ by 18 inches, and weighs from 15.9 to 18.5 pounds, depending on options. The mouse has nylon rollers rather than a track ball (so it can be used on almost any surface) and has two buttons; the second button provides a double-click. A port is available for the Big Picture large display and possibly the Radius Full Page Display. Besides the standard 110/220 AC power, the Lap-Mac is run by a 12-volt DC power supply, as well as 24- and 48-volt DC batteries, which conform to most military vehicle power supplies. Colby plans to produce a version with a removable internal battery power supply. Other options include a 300/1200-baud modem, an external hard disk with up to 200 megabytes of storage, and Levco's Prodigy board (with a 68020 microprocessor and 60881 coprocessor). Colby also offers the Flat-Mac, a version less compact than the Lap-Mac with additional features including composite video, and has plans for a Tempest version that would meet military security specifications.



DAN ESCOBAR

Lap-Mac
Colby's Lap-Mac features a 12-inch plasma display and an array of options, including extra memory and a 60MB removable hard disk.

All three companies will be competing for government and business sales, and all hope that Apple will supply them with components for their Macintosh portables.

borders of windows) produce a light ghosting effect in the same row of pixels across the entire screen.

As its keyboard, the Dynamac simply incorporates the Mac Plus keyboard minus the numeric keypad—an omission that may upset traveling spreadsheeters. Because the built-in, retractable carrying handle doubles as a prop in the rear of the computer, the resulting angle of the unit is

Dynamac is more compact but just as heavy as a standard Macintosh.

smaller than the angle for which Macintosh ergonomic engineers sculpted each row of keys. Typing on a tabletop for long periods can be uncomfortable. Moreover, the keyboard is set so far back from the front edge of the unit that the heels of your hands bump into the cabinet while typing or musing between words (the location of the keyboard was under review at press time).

Extra Features

The unit I previewed was loaded to the gills with 4 megabytes of memory and a fast 40-megabyte hard disk to store "thousands of page-equivalents." While the prototype had a very loud fan and a barely audible internal speaker, Dynamac says production units will have a much quieter fan and an improved speaker to accommodate Macintosh computer music lovers.

Using the built-in modem—none other than the minuscule Apple Personal Modem—required no more effort than does my regular external modem. Unfortunately, the Dynamac's cut-and-paste product design methodology shows through again. Other than a common power supply, there is no apparent internal connection between the modem and the computer. Dynamac supplies a rear-panel jumper cable that you connect between the Mac Plus's modem connector and the modem's data connector.

An essential ingredient of portable computers is battery power, so the computer can avoid being tied to an AC power cord. The Dynamac I worked with didn't have battery power, but the company plans to add this option. However, a battery would add substantial weight to the unit, as EL screens require plenty of power.



JEFFERY NEWBURY

Figure 1
A fully configured Dynamac weighs in at 18 pounds (about the same as the Mac), but is housed in a less cumbersome box. The machine comes with up to 4MB of memory and an optional 40MB internal hard disk and modem, as well as an electroluminescent (EL) flat-screen display and Mac keyboard sans numeric keypad.



The Dynamac's back panel includes Mac Plus motherboard ports, a 115/230-volt switch, keyboard and keypad ports, a composite video port, and an E-Machines Big Picture interface. The top row includes interrupt and reset switches and modem controls.

The Final Estimate

Definitions of *portable* vary, but in my book the Dynamac is not much more portable than a Macintosh equipped with an internal hard disk. The machine weighs in at 18 pounds, so it's anything but a laptop computer (which should weigh less than 4 pounds if you like to keep blood flowing to your feet). You won't be inclined to lug this baby around unless it's absolutely necessary. The idea of a true laptop Mac remains problematic anyway, until someone builds in a keyboard-mounted track-ball controller to replace the mouse—or better still, a touch-sensitive panel display. Don't even bother trying to use a portable Mac in an easy chair or on a hotel bed without first rigging up a smooth surface for the mouse.

How to Identify a Real Macintosh Portable

As we've seen, the first crop of flat-screen Macintoshes consists of nothing more than Mac Pluses on video diets. Because they are built around a motherboard that was designed for anything but portable computing, the machines are still too big, heavy, and power-hungry to be truly portable. If Apple can condense most of an Apple II into one chip, as it did for the Apple IIGS, it can surely achieve similar integration levels with the Mac's circuitry. So, without demanding gigantic leaps in hardware technology, and presuming software similar to what we're using today, here's what I'd like to see in a laptop Macintosh.

First, you should not have to buy a portable Mac as a second machine. Rather, the portable unit—no larger or heavier than a notebook-sized, 4-pound Radio Shack Model 102 or 200—should be a removable central module of your desktop system. While the portable unit will have its own connectors for AppleTalk, hard disks, and so on, the desktop computer will provide a large-screen display, a detached keyboard, expansion slots for coprocessor boards or other add-ons, and an optional 80- or 150-megabyte hard disk.

When you need the portable module (whether for a meeting across the hall or a trip across the country), you'll be able to lift it out of the main unit. An internal battery pack will supply enough power for at least 8 hours of portable computing. If the battery cannot be charged by gathering available light with embedded solar collectors, then the battery packs should be removable cartridges, in case an excursion keeps you away from an AC outlet too long.

Inside the portable unit will be 4 megabytes of nonvolatile RAM (i.e., its contents won't be wiped out when you turn off the machine), a 1.6-megabyte, 3½-inch floppy disk drive for document backup, and 2 or 4 megabytes of electronically erasable, programmable read-only memory (EEPROM) chips. These EEPROMs will allow you to download essential application programs from the desktop machine's hard disk into solid-state chips that run silently, require no power for storage, and can be reloaded with other applications later.

For long battery life and light weight, a liquid crystal display (LCD) is essential. But the display will need excellent contrast and backlighting for operation in low-light situations. It should display 640 by 400 pixels, which is 46 percent more than the Mac Plus CRT.

If the display is a tilted panel, as in the Dynamac portable, a track-ball controller or similar hand-operated device must be incorporated into the keyboard area to control the on-screen pointer. But if the display is flush with the top of the computer, as on the Model 102, a touch-sensitive LCD panel with 1-pixel resolution will allow menu selection and other imprecise actions to be performed by pointing with your fingers. Detailed graphics work will be accomplished with a stylus directly on the screen.

This ideal portable should also have a built-in 2400-baud modem. An alternative to the telephone modem would be an optional packet radio modem for communicating with a wireless network throughout your company's facilities. Therefore, while you're sitting in a meeting, you'll be able to tap out an electronic mail message from your laptop machine and enter it into the network without connecting a cable.

Finally, the machine must be affordable. The portable unit can be the basic Macintosh starter system, since it will function quite nicely as a standalone computer. College students should be able to buy one without breaking their budgets. Later you can add the desktop companion that opens the way for mass storage, large screens, a detached keyboard, and other expansion possibilities.

Any innovators out there?

Dynamac's one traveling advantage over the original Macintosh cabinet is its flat form, which makes it easier to handle in close quarters like airplane aisles and crowded sidewalks. Still, a bellhop will think you're checking in with gold bars in the carrying case.

What he doesn't know is that you needed gold bars to buy the Dynamac. With prices in the $5000 to $7000 range (depending on modem, hard disk, and memory options), we're talking a lot of bucks for the limited convenience of a slimmer package.

I'm sure some businesses and government agencies that require the Mac's ease of use in a slimmer, self-contained form will buy up limited quantities of Dynamacs. But even though I long for a portable Mac, the Dynamac and other first-generation portables don't make the grade. There's still a long way to go before the Macintosh is fashioned into a real live Dynabook. □

See *Where to Buy* for product details.



Pascal Two Ways

TML and Lightspeed Pascal compared

From the outset, Apple made it easy for Pascal developers to program the Macintosh. Requiring programs to follow the Pascal conventions when calling the Toolbox routines gave Pascal programmers a distinct advantage. Even though many chose to develop in C, Pascal remained the Mac's native tongue.

The first Pascal programming tool, *Macintosh Pascal,* produced by Think Technologies for Apple, was an interpreter rather than a compiler. The first true native-code compiler, TML's *MacLanguage Series Pascal,* was released in December 1985.

Following is a comparison of two recent Pascal releases: Allen Munro reviews *TML Pascal* version 2.0 and Dennis Cohen evaluates Think Technologies' *Lightspeed Pascal.* Together these reports summarize the current state of Pascal programming on the Mac.

ILLUSTRATIONS BY JOHN HERSEY



Blazing Pascal

by Dennis Cohen

Think Technologies, developer of the acclaimed *Macintosh Pascal* and *LightspeedC,* as well as *Instant Pascal* for the Apple II series, has introduced its first Macintosh Pascal compiler: *Lightspeed Pascal.* Think has aimed this product at the educational and hobbyist markets, and has scored a bull's-eye.

The Projects Approach

Lightspeed Pascal's combination of a built-in editor (virtually identical to the one in *Mac Pascal*), a compiler, a linker and interactive high- and low-level debugging facilities makes it a complete, integrated Pascal development environment. The package comes on three single-sided disks: a System disk that contains the environment, a Libraries disk, and a Utilities disk. The minimum configuration for *Lightspeed Pascal* is a 512K Mac with two single-sided disk drives. As usual, the minimum is workable but inconvenient, the limiting factor in this case being disk space rather than RAM.

Lightspeed Pascal programming is based on the concept of a *project,* which is a document that tracks the relationships among files needed for the program under development. The project document also contains information about compilation order, compiler options, fonts, and other miscellany. This novel concept—introduced with *LightspeedC*—greatly speeds the compile-and-link process, since it collects in one place everything needed to build a program.

You never have to leave the *Lightspeed* environment to "build" (Think's term for the compile-link process) a project. Once you have built the project, you may run it, much like a *Mac Pascal* program, from within the *Lightspeed* environment and take advantage of the package's trace and debugging facilities. When the program runs to your satisfaction, you turn off the various debug flags and tell *Lightspeed Pascal* to "build the application." The program responds by placing a double-clickable application on the desktop. If you want a distinctive icon for the program, you must modify the bundle (BNDL), file reference (FREF), and icon list (ICN#) in the resource file. In addition, you must use a utility such as *ResEdit* or *Fedit Plus* to set the creator. I recommend you either acquire or write a SetFileCreator desk accessory or a utility that you can run within *Lightspeed* to perform these chores.

Lightspeed Pascal provides direct access to most of the Toolbox routines in *Inside Macintosh* (Addison-Wesley, 1985). Routines you can't directly access are available from libraries included with the package. Think has provided for Inline directives, a feature familiar to Lisa Pascal programmers. In fact, *Lightspeed Pascal* lets you compile *Mac Pascal* programs virtually without change, though you'll probably want to alter them so that you can call Toolbox routines by name rather than through the Inline statements used in *Mac Pascal. LightSpeed Pascal* can also compile, without many changes, most small Lisa Pascal programs found in the liter-

Pascal Compilers Compared

Three aspects of the compilers are compared: size of compiled code and compilation time, using the MiniEdit application (taken from Chernicoff's Macintosh Revealed*); and run time, using the programs* Towers of Hanoi *and* Sieve of Eratosthenes. *All tests were run on a Mac Plus with an Apple Hard Disk 20.*

	TML Pascal (2.0)	MPW Pascal (1.0B2)	Lightspeed Pascal (1.0)
Compile and Link MiniEdit*	89 seconds	192 seconds	61 seconds
MiniEdit program	10,611 bytes	11,102 bytes	12,017 bytes****
Run Tower of Hanoi (20 disks)**	84 seconds	86 seconds	86 seconds
Run Sieve of Eratosthenes***	12 seconds	12 seconds	13 seconds

*Taken from Chernicoff, *Macintosh Revealed,* Hayden, 1985

**No text input/output. *Lightspeed Pascal* was about 8 times slower than the others when writing text to the screen.

***20 iterations.

****Using default Pascal libraries.

All tests were run on a Mac Plus with an Apple Hard Disk 20.

ature. All syntactic and semantic differences between the two implementations are documented in an excellent manual.

Built for Speed

When it comes to speed, this package earns its name—the compile-and-link process is exceptionally fast (see "Pascal Compilers Compared"). When an error is found, a message appears in a dialog box at the top of the screen (you have to click in it to do anything, but there's no button to indicate this). If the error is in the source, the editor automatically opens up with a "thumbs-down" pointer at the beginning of the line containing the error. Most errors are discovered during the editing process, since the editor reformats ("pretty-prints") your program as you type it, virtually eliminating the problem of missing semicolons and END statements.

Although the editor does what it's designed to do extremely well, experienced programmers may not like that design. The pretty-printing algorithm is described in *Pascal with Style: Programming Proverbs,* by Ledgard, Hueras, and Nagin (Hayden, 1979). This isn't surprising—Jon Hueras is one of *Lightspeed Pascal*'s authors. It *is* surprising that you cannot disable the pretty-printing function. This could be a problem for professional programmers, who have to live with coding standards, imposed by corporate or government regulations, that differ from the format imposed by the *Lightspeed* editor. In addition, I found the editor's font- and size-selection functions inconvenient; fortunately, you'll only need these once per project.

Lightspeed Pascal lets you divide your code into units, which you can then compile separately. However, each *Lightspeed* unit is one—and only one—segment. This means that you cannot compile different routines in the same unit into different segments, as you can with other development systems. It also means that you cannot break a desk accessory into multiple compilation units, since that would give you multiple segments—something forbidden to DAs. Another drawback is that the size of a single file/compilation unit is limited to somewhere between 2000 and 3000 lines, and the compiler slows down even before you've hit the actual size ceiling.

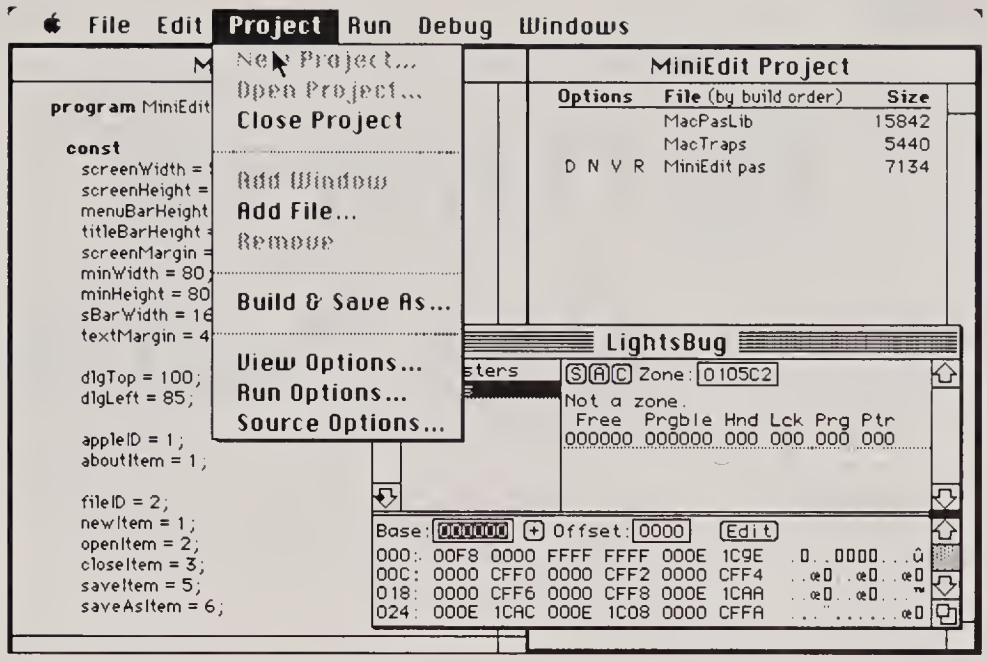


Figure 1
The Lightspeed Pascal *development environment is based on the* project. *In debugging an application, you can simultaneously view the source code in the edit window and the LightsBug debugger.*

One of the trade-offs this package makes can be seen in the size of the applications it produces. Programs that I translated to *Lightspeed Pascal* were consistently larger than the same programs in *MPW Pascal* or *TML Pascal.* However, according to Think, if you used the smaller versions of the Pascal libraries, the programs would be comparable in size to those created by *MPW Pascal* or *TML Pascal.*

Debugging with Style

The *Lightspeed* environment provides three levels of debugging. The first, source-level debugging, uses the Step command, Observe window, and Instant window familiar to *Mac Pascal* programmers. The second, LightsBug, is an assembly-language debugger that knows your variables by name, allowing low-level debugging with a high-level interface (see Figure 1). The third is the traditional Macintosh debugging facility with the interrupt switch and either MacsBug or *TMON.* This collection of debugging and development facilities is superb. You can access the first two levels of debugging from inside *Lightspeed Pascal.* This is made possible by some specialized memory-management techniques that let *Lightspeed Pascal* maintain a separate heap for your program.

The *Lightspeed Pascal* manual is, for the most part, excellent. The discussions are well organized and clear and offer plenty of examples. Despite an occasional reference to obscure terminology (such as "l-value," which will be unfamiliar to many readers), the meaning is usually clear from the context. A glossary and index complement a fine table of contents. At approximately 600 pages in an 8½- by 11-inch paperback format—plus a 28-page addendum—the manual is slightly unwieldy. Still, it's one of the best I've encountered for any kind of software product. Its only weak point is a discussion of support routines for the 128K ROM and HFS, which was a last-minute addition.

Think has also included and carefully documented methods for creating desk accessories, the various xDEFs, and other arbitrary CODE resources.

Programming Bargain

Think has done an excellent job on this product, and its list price of $125 is a bargain. *Lightspeed Pascal* currently has no rival in the educational arena, and for the casual programmer (beginning, intermediate, or advanced), a faster, friendlier environment would be difficult to find.

When it comes to the professional developer, other considerations apply. I still recommend *Lightspeed Pascal*, used the way I use it. Debug your program (or pieces of it) under *Lightspeed* and then move to either *TML* or *MPW* for last-minute tweaking and final compilation. The time spent moving your program from *Lightspeed* to one of the other compilers is negligible, and the time savings provided by the *Lightspeed* environment are significant.



Return of the Native

by Allen Munro

As a follow-up to its first native-code compiler for the Macintosh, TML has released version 2.0, which adds objects to its already comprehensive Pascal repertoire. *TML Pascal* 2.0 can compile Apple's standard Lisa Pascal examples for the Mac as well as most other *Mac Pascal* programs, with few modifications. With some exceptions, it also compiles *Macintosh Programmer's Workshop Pascal (MPW Object Pascal)* programs. *TML Pascal* generates compact, fast applications that can be opened from the desktop and don't require special support files (such as the run-time interpreters required by both *Mac Pascal* and the *MacAdvantage Pascal* system). *TML Pascal* can directly compile desk accessories for installation with the Font/DA Mover.

TML Pascal requires at least a 512K Mac and 800K of disk storage. You could develop small programs on a 512K Mac with a single 400K disk drive, but the process would be awkward. To make such a minimal system work, you would have to create several system disks, each with a different development tool—editor, compiler, linker, or *RMaker* (Apple's resource compiler). As with any program development system, *TML Pascal* handles elaborate projects more easily if you have mass storage. *TML Pascal* is not copy protected, so it is easy to use with a hard disk.

In addition to a fast Pascal compiler, the *TML* package includes an efficient linker, *RMaker,* and the editor (see Figure 2) from Apple's *Macintosh Development System* (MDS), which is Apple's original *Macintosh Assembler* development toolkit, not to be confused with the more elaborate programming environment provided by *MPW. TML Pascal* is compatible with *MDS* in a number of ways. You can use a compiler option to generate assembler source code with the Pascal source statements inserted as comments. If you are an *MDS* owner, you can make modifications to these source files and assemble them with the *MDS* assembler. This feature is especially useful for programmers who use Macintosh debuggers like *TMON* or MacsBug, which produce output that can be understood only from an assembler perspective.

TML Pascal makes every Mac ROM routine available to the programmer via the syntax described in *Inside Macintosh* (Addison-Wesley, 1985). You can compile programs that have the features of the standard Macintosh user interface, including multiple boxes, pull-down menus, dialog and alert boxes, and the ability to cut and paste. For example, the *TML* package compiles the sample program MiniEdit described in Stephen Chernicoff's *Macintosh Revealed, Volume 2* (Hayden, 1985)—which contains over 2200 lines of source code in a 96K text file—in under two minutes (see "Pascal Compilers Compared").

Plain Vanilla Programming

TML Pascal doesn't force you to implement all the features of the Mac interface if you don't want them. Many programmers want to create small utility programs for their own use and would rather not write all the code necessary to set up windows and menus, retrieve messages from resource files, and so on. "Plain vanilla" applications automatically provide a simple interface with a standard window to which *MacWrite* and *MacDraw* statements send their output, enabling both text and graphics to be displayed. You can set up dialog-based interactions if you wish, or simply have the user type commands in response to your prompts in the standard window.

To invoke the plain vanilla compilation mode, you simply include the parameters INPUT and OUTPUT in your program declaration, as in

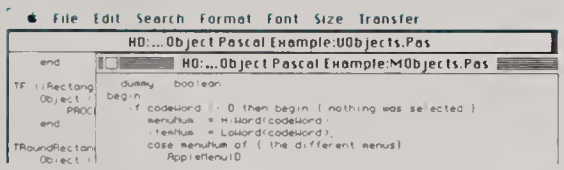
```
Program MyAmortization (INPUT, OUTPUT);
```

The vanilla mode is also useful for writing quick exploratory programs. And it provides an easy way to enter and test Pascal textbook examples.

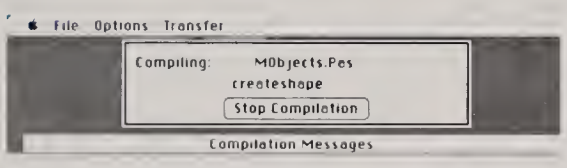
Version 2.0 of *TML Pascal* includes a number of improvements over previous versions. Foremost among these is the ability to break programs into separate modules, or *units,* for independent compilation. A very large Macintosh application may require thousands of lines of Pascal code. Even though the compiler is fast, programmers won't want to wait for the compilation of an entire program every time a small change must be made and tested. *TML Pascal*'s ability to compile units independently means that when you make changes, you usually have to recompile only one or two units and then link the application back together again.

Programming Objects

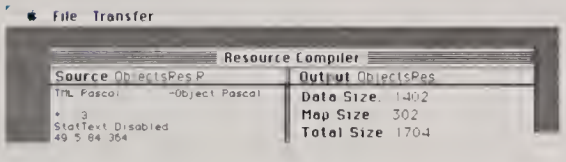
TML Pascal 2.0 supports some useful syntax extensions found in Lisa Pascal and *MPW Pascal,* such as the standard procedures Exit and SizeOf and an implementation of procedure parameters. More



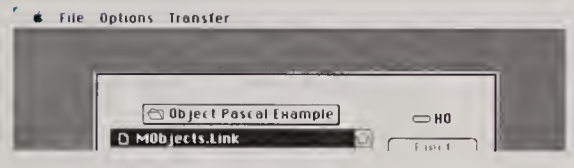
Prepare the Pascal sources and the resource files using Edit



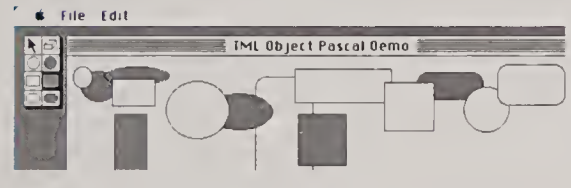
Compile the Pascal sources using the compiler



Compile the resources using the resource compiler



Link all the object files using the linker



Test the completed application

Figure 2

Creating an application program with TML *version 2.0 begins with the editor. Once the source file is complete, you compile the source and resource files, then link the resultant object files and run the application.*

important, version 2.0 implements *MPW Pascal*'s object features to support object-oriented programming. In standard Pascal, a declared procedure or function name can only refer to one defined set of actions. In object Pascal, however, many differently defined procedures can be referenced by the same name. Which procedure is invoked during execution depends on the object being acted upon (see "Object Orientation," *Macworld,* November 1986).

For example, in a *MacDraw*-like application, you might want to run through a list of objects in a document and draw them. In object Pascal, you could draw all the different kinds of objects by executing a simple statement like that shown in Listing 1. In standard Pascal, you would have to use a case statement like the one in Listing 2.

Of course, even with object Pascal, there's no free lunch. For each of the drawing primitives, you would have to define separate DrawObj procedures corresponding to the DrawTheText, DrawTheLine, and DrawThePolygon procedures required by standard Pascal. The object-oriented approach simply enables you to associate procedures and functions with the object types to which they apply, eliminating the need for difficult-to-maintain case statements throughout your code. (If you were to add a new type of drawing tool to the standard Pascal implementation of the drawing application in Listing 2, you would have to modify not only the case statement shown but also similar ones for saving, printing, and carrying out any other actions associated with the object.)

The object extensions to *MPW Pascal* are important, not only because they give programmers a powerful way to easily maintain their programs but also because they pave the way for *TML Pascal* to work with Apple's *MacApp* object library. *MacApp* simplifies the development of applications that support the full Macintosh interface, print to the ImageWriter and the LaserWriter, and cooperate with other Mac programs. At this writing, *TML Pascal* cannot be used with *MacApp*. Although the compiler can compile all object extensions to *MPW Pascal*, it has no provisions for conditional assembly, a feature *MacApp* requires. TML plans to add conditional assembly and will make future versions of the compiler *MacApp* compatible.

```
While CurrentObj <> NIL do
    Begin
    CurrentObj ObjDraw,
    CurrentObj := CurrentObj fNextObject
    End;
```

Listing 1

```
While CurrentObj <> NIL do
    Begin
    CASE CurrentObj ObjType of
     TextType: DrawTheText (CurrentObj),
     LineType  DrawTheLine (CurrentObj),
     RectType  DrawTheRect (CurrentObj);
     RndRectType: DrawTheRndRect (CurrentObj),
     OvalType: DrawTheOval (CurrentObj);
     ArcType  DrawTheArc (CurrentObj);
     FreeHndType: DrawTheFreeHnd (CurrentObj),
     PolygonType. DrawThePolygon (CurrentObj)
    END;
    {CASE  But other draw types may have to be
     added }
    CurrentObj  = CurrentObj fNextObject
    End;
```

Listing 2

Toolkit Integration

The *TML* development tools—compiler, linker, editor, and resource compiler—follow the Mac user interface for the most part. When used under HFS, the linker looks for needed files not only in the current folder but also in any folders that have been flagged for searching by the Set Paths accessory. This utility, which is included in the *TML Pascal* package, works well with floppy disks and many, but not all, hard disks. With the Corvus OmniDrive, for example, the linker finds the relevant files, but the user must confirm each file selection.

TML Pascal doesn't force you to quit each development tool before going on to the next one. The package provides a Transfer menu, which permits you to go directly from one application to another in the same folder without going through the Finder. A Compile & Go feature in the compiler forces an automatic transfer to the linker after compilation and then launches the new application.

Unfortunately, *TML Pascal* does not come with a facility for application building. This capability, implemented with Make files in UNIX and with the Build and Make tools in *MPW,* automatically determines which units of an application must be recompiled, based on known dependencies among the files and on the times of the files' revisions. In *TML Pascal,* it's up to the programmer to determine which files must be recompiled after a change.

TML Pascal comes on two 400K disks that include the four development tools, Apple's Font/DA Mover, a compact System file, the Set Paths desk accessory, sample programs, and a set of Pascal source files for the Toolbox and for other useful interface units. These include units for AppleTalk support, speech synthesis, HFS, SCSI, and SANE.

TML Pascal version 2.0 is quick, inexpensive, and relatively easy to learn. It does not incorporate sophisticated symbolic debugging, but as a low-cost native Macintosh programming system, it's an excellent value. □

See *Where to Buy* for product details.



Judy Treible of Knight-Ridder Graphics with one of her first tries at complex, free-form* MacDraw *art. The drawing consists of over 200 un-smoothed polygons.

PHOTOGRAPHS BY MARK

Newsroom Graphics

by Stuart Silverstone

In newspapers around the country, Mac graphics are hitting the front page.

When most people think of the Macintosh in the print media, the images that come to mind are of desktop publishing. Another type of Mac publishing application has gone largely unnoticed, although evidence of it has been right under our noses for some time—in our daily newspapers.

The pressures of time and money in the newspaper industry are prompting more and more art departments to computerize their graphic production, and the Macintosh has overwhelmingly been the machine of choice. According to a survey taken by the Knight-Ridder newspaper chain, over 70 percent of large and medium-size newspapers in the United States use a Mac to help produce their editorial art. Applications range from one-column locator maps and data graphs to sophisticated explanatory diagrams, full-color weather maps, and special typographic effects.

"What the Macintosh has done is to fill a demand that has been building over the past few years," says Roger Fidler, director of graphics and newsroom technology for the Knight-Ridder newspaper chain. "We see papers that never used informational graphics now using them every day, often on page 1 and in color."

The reasons for this are many. As stories change, Macintosh graphics can easily be edited. They can be transmitted via modem for sharing with sister publications. And stock elements, such as maps, can be stored in graphics libraries and used repeatedly.

The Mac also cuts graphic production time dramatically. The Gannett chain, publisher of the liberally illustrated *USA Today,* has been a leader in the trend toward newsroom use of the Macintosh, with almost 150 Macs throughout its 95-newspaper chain. According to Richard Curtis, *USA Today*'s managing editor for graphics and photography, "A simple graphic that used to take an hour or more to produce now takes 15 minutes, and most of that time is spent waiting for the LaserWriter to print."

PressLink

The Knight-Ridder newspaper chain has helped establish the Mac as an industry standard by creating the telecommunications network PressLink, which distributes news graphics to 28 Knight-Ridder newspapers as well as to Knight-Ridder Graphics Network subscribers.

Wire services such as UPI and AP have transmitted news graphics for years. Such systems enable subscribing publications to receive photographs and graphics via facsimile machines with resolutions of 135 lines per inch. With this technology, it takes about ten minutes to receive an 8- by 10-inch photo. A Mac, by contrast, downloads a graphic in two to three minutes. And PressLink illustrations look much better than wire-service drawings, since they can be printed directly on a 300-dot-per-inch LaserWriter or on a 1270- to 2540-dpi PostScript typesetter.

But probably the most significant advantage of Mac-telecommunicated graphics is how easily they can be changed. As details continue to develop on a late-breaking news event, for example, the originating news service need not revise its illustration. Often, receiving newspapers can bring the illustration up to the minute by editing text or graphics slightly. Newspapers can easily customize complex illustrations to fit their own type styles or formats. And local papers can adjust transmitted graphics to emphasize issues of interest to readers in a particular geographic area.

The ability to transmit illustrations by modem particularly benefits newspaper chains, since it enables them to capitalize on their geographic dispersion. Diagrams for stories like airline accidents or shootings, for instance, can be generated by local papers and then distributed nationally. In addition, artists in different parts of the country can bring different skills to bear on the same illustration.

MacDraw Polygons

In addition to breaking new ground for the electronic distribution of news graphics, Knight-Ridder has developed a team of talented *MacDraw* users who have stretched the capabilities of Macintosh drawing software beyond what its creators could ever have imagined (see "MacDraw Tips from the Experts"). Newspaper artists prefer *MacDraw*'s object-oriented graphics, made up of line vectors and geometric shapes, to bit-mapped documents like those created in *MacPaint,* because they provide greater flexibility in manipulation and editing, higher output resolution, and smaller files for faster telecommunication.

MacDraw's most common function is the polygon tool. A series of smoothed polygons, some without visible border lines, can be filled with various patterns to create artistic illustrations that don't appear to have been drawn by computer. Judy Treible of Knight-Ridder Graphics in Washington is emerging as a master of the free-form polygon illustration. She recently produced an informational graphic about heart-bypass operations that included a smoothed polygon with more than 200 sides (see Figure 1). An earlier effort, an elegant image of the Statue of Liberty, was created as a series of unsmoothed polygons, including one with more than 80 sides. "I'm learning as I go," Treible admits. "With the Mac you can't rely on a descriptive line that varies in thickness, as you can with hand tools. So you need to find other ways to suggest volume and shape."

Map Illustrations

The needs to locate international, national, and local news events; to display geographically distributed data; and to illustrate daily weather patterns make the map one of the most common graphic elements in a newspaper. Although many newspapers use clip-art software, such as *MacAtlas,* most larger papers make customized maps. Using *MacDraw*'s polygon tool and a tracing tablet with a stylus, such as MacTablet, news artists can quickly trace existing hard-copy maps, digitizing their coordinates into the Mac's memory.

George Rorick is a Mac news artist and cartographer. An eight-year veteran of journalism graphics, Rorick used his sophisticated airbrush skills to fashion the distinctive look of *USA Today*'s weather page. Known for his speed and efficiency, Rorick was able to update the colorful daily weather map, with all its required overlay art and printing masks, in a couple of hours. Now, as acting graphics director at Gannett's *Detroit News,* Rorick is transferring his finely honed illustration skills and production techniques to the Mac. Rorick's staff can update the *Detroit News*' daily weather map in less than an hour (see Figure 2). In addition, Rorick saves a significant amount of time and money by producing updates on the Mac and transmitting them electronically via modem to the *Detroit News* production plant 28 miles from the art department. This procedure eliminates the need for a courier, and production of the maps starts up to six hours sooner, avoiding conflicts with other projects near deadline time.

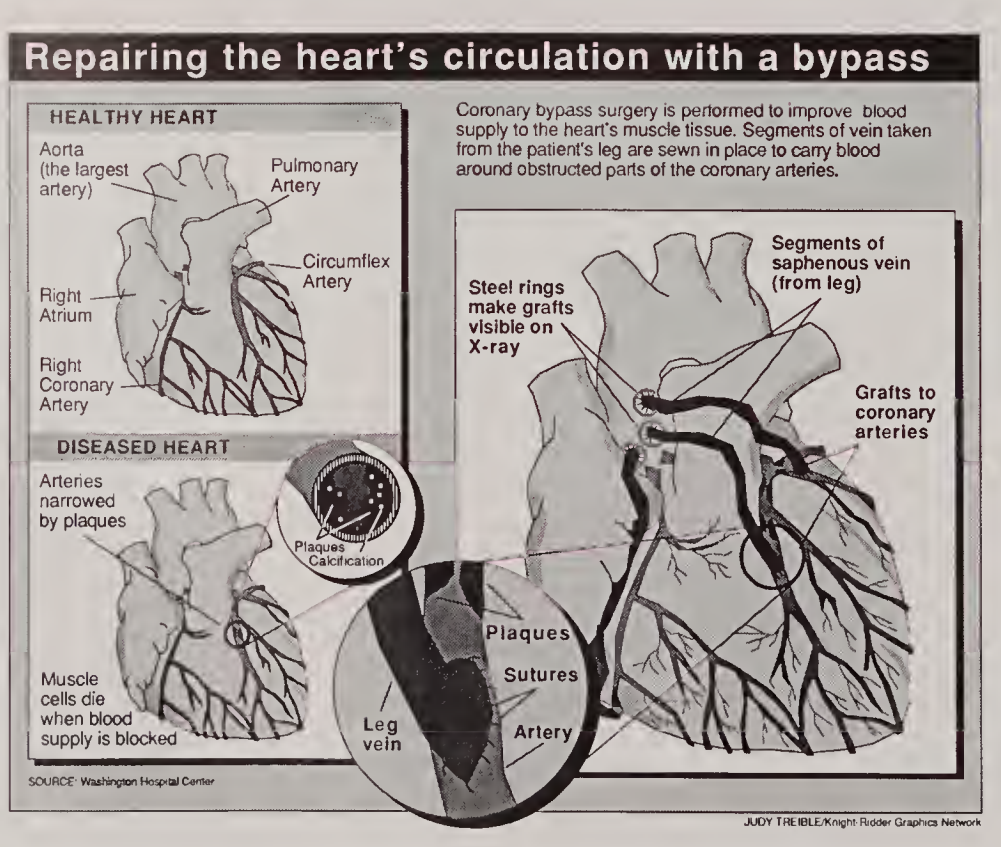
To produce a frequently used world map, Rorick traced reference maps on a MacTablet digitizing board. His finished product, complete with drop shadow and artistic flourishes, took several hours. His latest effort is a full-color national weather map with an enlarged inset of the Michigan region produced on the Mac. "Some of these projects take a little bit longer than doing them by hand, because I haven't worked enough on the Mac," admits Rorick. "But once something's done, I have so many options. I can rotate it, squeeze it, stretch it—that more than makes up for the extra time."

Data Graphs

Statistical graphs are another common type of newspaper illustration (see Figure 3). The Mac and its graphing software not only streamline the graph-making process for the news artist, they can also improve the content. "With the Mac, we can now take information from a researcher or reporter and chart it quickly, to see if the basic thesis of the story is accurate," says *USA Today*'s Richard Curtis. "Sometimes the story describes a 'tremendous rise,' when in fact the data shows just a gradual increase."

Producing repetitive graphs, such as those for daily stock prices, is especially efficient on the Mac. In fact, their production can be essentially automatic. Macro programming software such as *Tempo* can direct the Mac to dial into a computer database and retrieve stock prices at a specific time of day. The macro program then loads the data into graph-generating software, such as *Excel* or *Cricket Graph,* which in turn generates a chart in the paper's predetermined format.

Figure 1
The heart in this Knight-Ridder graphic consists of more than 150 MacDraw *objects, mostly polygons—including one, for the complex path of the arteries, with about 200 sides. All the typography is Mac generated as well.*



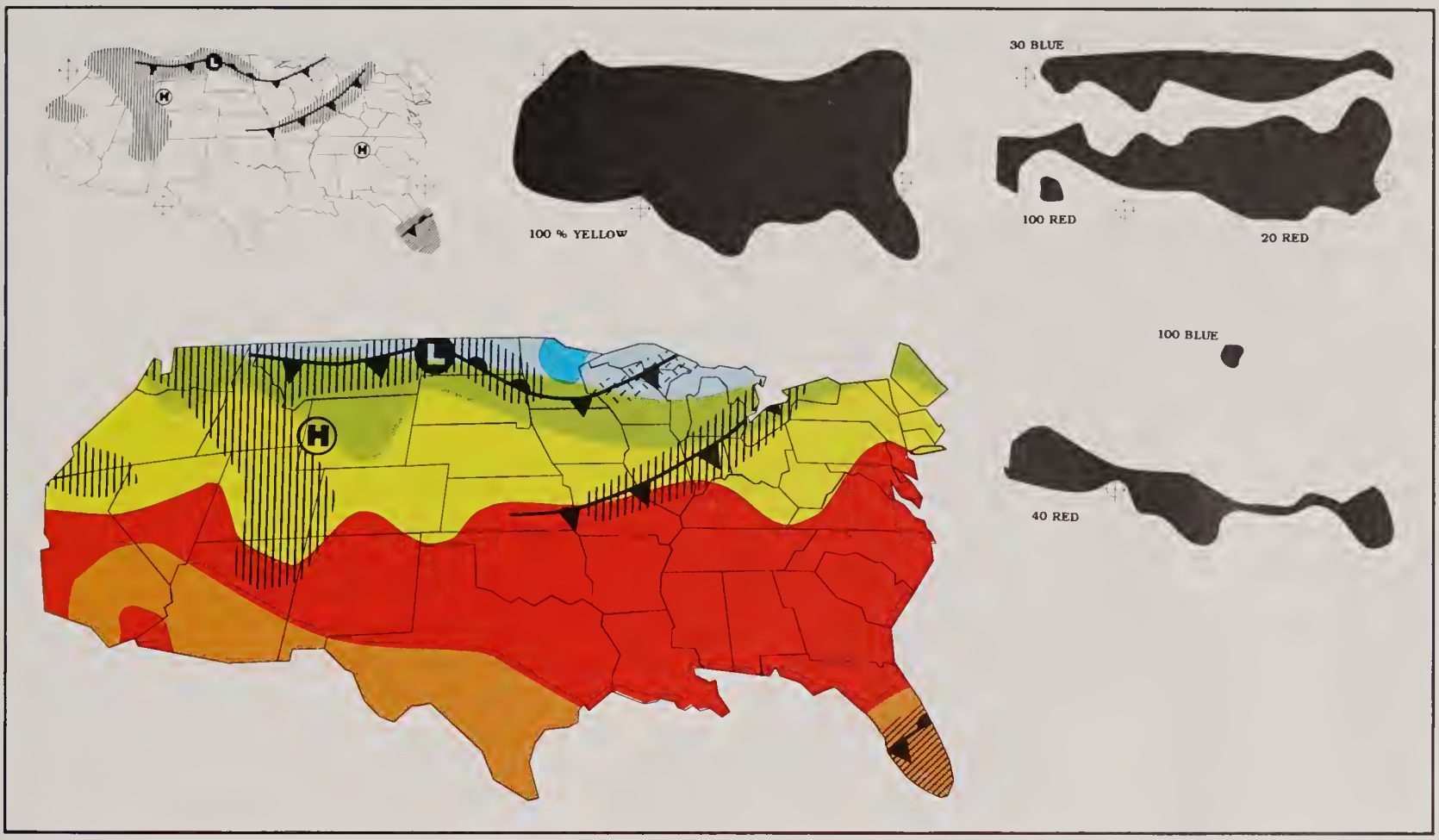


Figure 2
Screens such as these are used to produce the Detroit News' *daily weather map. By combining various shades of the three primary hues,* Detroit News *artists can produce up to ten colors. A mask like the one in "Masking A Map" is used to trim the edges of the weather screens to conform to the base map's edges.*

Color Overlays

Although the Mac cannot currently produce color directly on its screen or on the LaserWriter, many news artists produce full-color illustrations by constructing several black-and-white overlays on the Mac (see Figure 2). Three overlays represent the three primary colors used in many graphic processes—cyan, magenta, and yellow—with a fourth overlay for the black portion of the illustration, including text, outlines, and shadows.

These *blackline mechanicals* produced on the Mac are used to expose a film negative, which in turn is used to burn metal offset plates. When the plates are rolled with magenta, yellow, cyan, or black ink, they imprint images of those colors on newsprint. Combinations of the three primary colors produce a wide range of hues, and the results are at least as good as those obtained with hand-cut screens.



The U.S. map above reflects the artistry of the Detroit News' *George Rorick. Rorick has more than halved his map production time by using the Mac.*

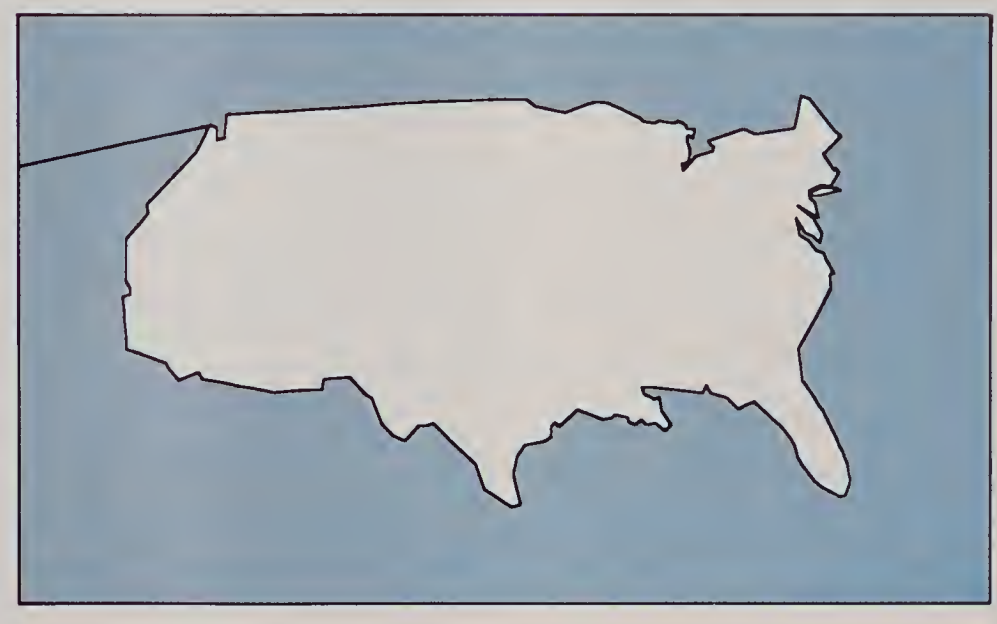
MacDraw Tips from the Experts

The following *MacDraw* pointers were collected during interviews with graphic artists across the United States. Most of these tips relate to *MacDraw*'s polygon tool, which Mac news illustrators use extensively.

- To create complex shapes, news artists draw polygons with many short sides containing numerous points clustered together. Use a plastic paper clip to keep the Option key depressed so that the Mac will not close the polygon before it is completed.
- You can override the polygon tool's free-form drawing style by depressing the Shift key as you draw, to make polygon sides perfectly horizontal or vertical.
- Unlike *MacDraft* or *CricketDraw, MacDraw* won't let you add extra vertices to polygons. By building in extra vertices when you create a polygon, you can give yourself more flexibility for revising a drawing.
- You can create polygons larger than the screen by drawing a complete polygon that is simpler than the final shape you plan to create. Make sure this initial polygon has many extra points so that you can reshape the polygon later using the Reduce to Fit command.
- You can proportionally enlarge any *MacDraw* graphic by first surrounding it with a close-fitting rectangle, next grouping the graphic and the rectangle, and then drawing a diagonal line that continues beyond the two corners of the rectangle. Enlarge the graphic by dragging the rectangle along the diagonal line, and then delete the rectangle and guideline.
- By working on a drawing at 400 percent of its final size and then printing at a 25 percent reduction, you can use all four line thicknesses in *MacDraw* to produce a variety of line weights for emphasis and visual effect.
- You can achieve sharper corners and more consistent line weight on smoothed polygons by using "cusps." Create a cusp by holding down the Option key and double-clicking as you draw a polygon. End the polygon by releasing the Option key and double-clicking.
- For applications like weather maps, which involve a large, reusable background shape and overlays of changeable information, a white "mask" can help you crop the edges of the overlay elements so that they conform to the complex shapes of the background polygons (see "Masking a Map").

Masking a Map

Create a mask with the polygon tool by tracing the perimeter of the background object and then, without closing the polygon, double back around the outside of the perimeter. In this way, you create a double-walled, hollow object whose inner border conforms to the background object's perimeter.



PostScript Effects

For even more sophisticated graphic treatments, some newspaper production artists are tapping the Mac's hidden potential by programming directly in PostScript—the machine language that interfaces the Mac with the LaserWriter. With a series of coded commands, these artists create softly graduated tones, unusual pattern designs, and type that is curved, sloped, or otherwise enhanced.

Mike Morrison, ad designer for the *Yuma Daily Sun* in Arizona, uses PostScript programming to achieve impressive effects in substantially less time than working by hand would take. As he explains, "Before, we sent out preprinted letters to the camera room to shoot copies of them, and then we cut out each letter by hand. It took just about all day. I would have a hard time doing without the Mac after using it for the last couple of years."

New PostScript drawing software, such as *Cricket Draw,* should enable Mac artists to achieve even more sophisticated effects. *Cricket Draw*'s PostScript editor, for example, will let designers set informational type in shades of gray or in patterns. And functions like *Cricket Draw*'s ability to rotate type or make it conform to curved lines should eliminate some of the stiff look typical of current computer illustrations.

Besides manipulating the many typefaces available on the LaserWriter, news artists can enhance a newspaper's appearance by creating their own typefaces. When the *Washington Post* wanted to use the Mac for news graphics but couldn't get access to a LaserWriter version of News Gothic, the art type specified in the paper's recent redesign, the *Post* staff duplicated News Gothic on the Mac. Using a Magic video digitizer, they scanned a hardcopy image of the upper- and lowercase alphabet of the font and then recreated the typeface with the *Fontographer* font editor.

Dummy Layouts

Although designers can create layouts with dummy type, some papers find the Mac a useful tool for mocking up page layouts at a reduced size. When artists use electronic representations of actual text, headlines, captions, and other page elements—received via modem or another electronic link with the paper's mainframe computers—their layouts give a more accurate idea of what a page will look like. Page layout software and scanned images of photos and graphics let designers more easily experiment with various page designs on the Mac's screen before sending the final layout to the production staff for encoding into the paper's typesetting system.

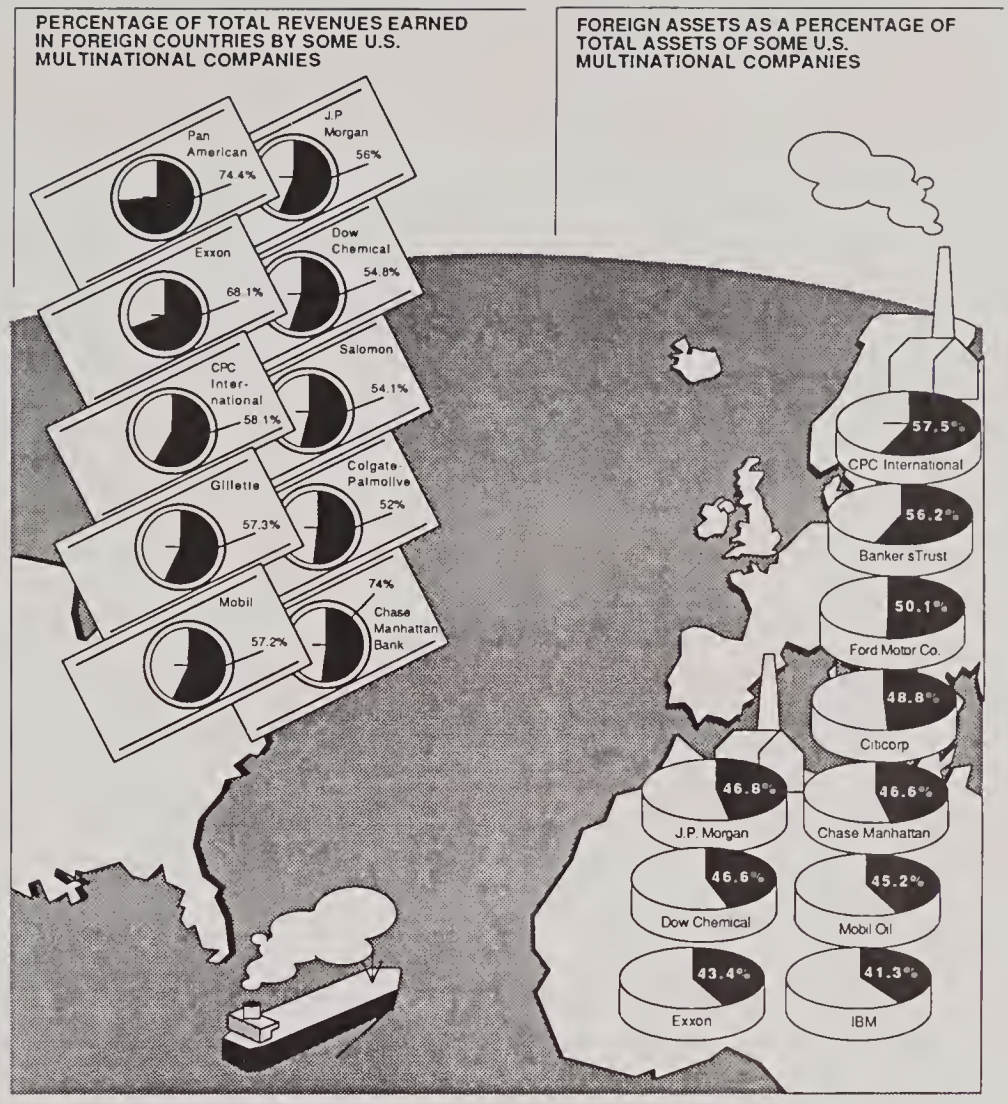


Figure 3
Laslo Vespremi of the San Francisco Examiner *used a combination of Mac products to create this illustration. He began with maps from* MacAtlas *and dropped them into* MiniCAD *to add dimensioning. The pie charts were generated in* Microsoft Chart, *and the drawing was assembled in* MacDraft.

The Future

The Macintosh has changed the way newspaper graphics are created and will continue to alter the overall appearance of large and small papers across the country. The trend toward more and better illustrations of complex news events has increased readers' graphic expectations. As computer technology becomes more powerful and inexpensive, readers will have even more opportunity to see exactly where news events are occurring, to visualize significant patterns of complex economic and social trends, to understand exactly how a failed mechanical system operates, and the like.

Improved graphics technologies should free journalists from the task of describing the mere facts of what happened and where, letting them focus instead on analyzing the important issues behind the news. □

See *Where to Buy* for product details.

■■■■■■■■■■■■ *For detailed news graphics tips every month, look into* Deadline Mac, *a newsletter sponsored by the Society of Newspaper Design. Contact the editor, John Monahan, at the Graphics/Design Department of the* Patriot Ledger, *13 Temple St., Quincy, Massachusetts 02169.*

Be a Winner!

Announcing the first annual

World Class Macintosh Contest

Macworld is proud to offer you an opportunity to cast your vote for excellence in computing–and perhaps win the ultimate Macintosh hardware and software system.

Usually we give you our opinions on the latest Mac products, but now, with the World Class Macintosh Contest, we want to hear what you think. Which Mac products do you find significant? Which have served you well during the last year? Which would you recommend to a friend? By voting for the Mac products of your choice on the attached contest-entry form, you can both reward the hard work of your favorite product developers and help keep *Macworld*'s editorial coverage on track.

You also earn a chance at a first prize of Macintosh hardware and software worth approximately $20,000. To show you our appreciation for taking the time to participate in this contest, we will pick three winners at random from among the World Class entry forms. The lucky grand-prize winner will receive a World Class system consisting of a Macintosh Plus, a LaserWriter printer, and each of the top-voted hardware and software products. A Mac Plus and a copy of each winning software package will go to the runner-up, and the third-place winner will receive a Mac Plus.

Entries must be postmarked no later than March 15, 1987; results will be announced in our September issue. To accurately reflect readers' preferences, we'll publish figures for all significant vote-getters in each category.

The following explanations define product categories that are not self-evident, to help you cast your votes appropriately.

1987 World Class Contest

Please use this entry form to vote for products you are familiar with and would recommend, based on their performance and value. Choose one product per category; you need not vote in all categories. Eligible products must be compatible with the Macintosh computer and commercially available as of February 1, 1987. **To ensure accuracy, we will not count a vote unless the following three items are provided: (1) correct product name, (2) manufacturer name, and (3) model number (for hardware only).** Version numbers of software products are not required. Please print or type your entry and submit it by March 15, 1987.

Name _____

Company _____

Address _____

City _____ Zip _____

State _____ Phone _____

Hardware

	Product	Manufacturer/Model
Display (Monitor)		
Hard Disk Drive		
Alternate Mass Storage		
Input Device		
Macintosh CPU Upgrade		
Modem		
Digitizer/Scanner		
Printer–Dot Matrix		
Printer–Laser		
Plotter		
Network Server		
Most Promising Newcomer		

Software

	Product	Manufacturer
Word Processor		
Spreadsheet		
Database Management		
Utilities–Programming		
Utilities–Disk and File		
Communications–General		
Programming Language		
Games		
Integrated Products		
Graphics–Business Presentation		
Graphics–Paint/Draw/Animation		
Graphics–CAD		
Accounting		
Desktop Publishing		
Desk Accessory		
Project Management		
Outline Processing		
Personal Management		
Tax Planning/Preparation		
Statistics/Math		
Spelling Checker		
Music		
Micro-to-Mainframe Communications		
File Server		
Financial/Investment		
Education/Training		
Most Promising Newcomer		

1987 World Class Macintosh Entry Form

FOLD HERE

Place
stamp
here

1987 World Class Macintosh Contest
Macworld
501 Second St. #600
San Francisco, CA 94107

Hardware

Displays
Alternative monitors that allow for large-screen or color display.
Alternate Mass Storage
All types of mass storage except hard disk drives. Examples include removable cartridge drives, tape backup units, and external floppy drives.
Input Devices
Mice, trackballs, graphics tablets, keyboards, joysticks—everything but digitizers.
CPU Upgrades
Products that increase the capability of the Mac's 68000 microprocessor, either by using faster 68000s or 68881 and 68020 devices.
Network Servers
Devices that enable users to share or transfer data between computers. This category includes file and disk servers as well as printer spoolers.

Software

Utilities
Programs that perform a wide variety of housekeeping chores, such as file conversion, file recovery, disk backup, and keyboard enhancement.
Integrated Packages
Products that include several applications—such as a word processor, spreadsheet, graphics program, and data manager—that share data and a command structure. The applications may be on one disk or in separate modules.
Graphics: Business Presentations
Packages that produce organizational charts; pie, bar, or line charts; or other graphics used by business people to present information.
Graphics: CAD
Computer-aided design includes two- and three-dimensional products used to input and edit geometry, especially for applications in mechanical, architectural, and electrical engineering.
Accounting
A series or an integrated package rather than a single module (such as general ledger).
Desk Accessories
Any program that you can install under the Apple menu and that doesn't fit in any other category. Examples include calculators, notepads, schedulers, calendars, and phone dialers.
Project Management
Programs that manage resources and scheduling, usually for large, complicated tasks.
Outline Processing
Stand-alone programs or desk accessories that organize ideas and notes in outline form.
Personal Management
Programs that organize personal data or assist with personal finances, diet, dating, or other matters.
Micro-to-Mainframe Communications
Programs that perform terminal emulation and data conversion for mainframes and minicomputers.
File/Disk Servers
Devices that enable multiple network users to make use of one storage device.
Financial/Investment
Programs that retrieve stock information, perform portfolio management, or assist in fundamental or technical analysis.
Education and Training
Training programs provide tutorials on such subjects as typing or computer applications. Education software includes courseware or examination-preparation programs.

Most Promising Newcomers

Which new products—in both the hardware and software categories—are making an impact? (You may vote for a product you've cited in another classification.) For our purposes, "new" products are those released within the last six months.

Contest Rules

Each person may enter the contest only once. Entries must be printed by hand or typed on the form included in *Macworld* or on a reasonable facsimile. Your entry must include at least one product vote, plus your name, address, and daytime phone number. Entries must be postmarked no later than March 15, 1987. Employees of PC World Communications are not eligible. Please tape the form closed; *do not* staple the form. Thank you and good luck!

Mac E-Mail Comes of Age

by Michael Miley and Prasad Kaipa

A sophisticated program fulfills a harried office manager's dream by providing a local area network of considerable potential

Frenzy and a relay race of paper shuffling provide two incriminating snapshots of the large modern office. But picture this: a local area E-mail network for the Macintosh that permits at least four Macs to route documents instantaneously to one another. The network operates in the background, boasts good security through the use of passwords and serial numbers, and permits selective bulletin boards to be set up. It sounds like a harried office manager's dream, but it's merely a description of *InBox,* a sophisticated program developed by Think Technologies.

Postal Requirements

Aside from an administrator to manage the network, in order to realize this dream you'll need a message center consisting of a 512K Mac with an 800K internal drive as the server (and, preferably, a hard disk); an *InBox* start-up kit with an administrator program; and three connections–plus any additional connections you require. (The latest version of *InBox,* which we haven't yet tested, permits you to use a nondedicated server. Should your network be larger than five stations, however, we recommend that you make the message-center Mac an exclusive E-mail server to ensure its stability.)

Since the message center does not automatically reclaim disk space after messages are deleted, at least 50K of disk space should be allotted for each connection on the message-center disk. Furthermore, all AppleTalk, System, and Finder versions should be identical and up-to-date to avoid incompatibility problems.

The setup procedure for *InBox* is easy compared to E-mail systems on other machines, thanks to the Mac user interface. You install *InBox* on the message-center Mac and then on the system disk of each node on the network. The application takes up about 34K of disk space. You must create a mailbox for each user, by including that person's name in the list of addresses, and assign everyone a password; public-access bulletin boards can be set up with or without passwords.

Unfortunately, the setup is hampered by a cumbersome copy-protection scheme. A key disk must be inserted every time someone administers the message center. (The next version is supposed to allow optional copy protection on the administrator disk.) Also, serial numbers register all copies of personal connections so that two copies of an *InBox* connection with the same serial number can't be on the system concurrently.

The Postmaster Seldom Sleeps

The extensive research that shaped the development of *InBox* seems to have paid off in ease of use and well-written documentation. *InBox* connects to the message center when you start it up; you then log on to the network with your name and password, or cancel (which permits you to read only bulletin boards). When you want to read or send messages, simply select the *InBox* desk accessory from the Apple menu. A dialog box quickly appears with icons that offer several options: your *InBox* mailbox, a mailing address list, phone and memo pads, a feature for enclosures, and your postman–the Send icon. Clicking the *InBox* icon displays a list of mail, including the senders' names, the dates, and (optionally) the times the messages were sent. Clicking the Address icon produces a list of everyone with a mailbox (see Figures 1 and 2).

The *InBox* administrator can customize the phone pad by changing the labels for the check boxes. Another feature permits you to enclose a document along with your memo. (An upcoming version is supposed to allow more than one enclosure.) And while the *MacWrite*-like text editor has a 30-page limit, the size of the appended file is limited only by memory. You then route messages by checking names on

the address list and post messages by clicking the Send icon.

InBox includes many thoughtful touches. Multiple messages can be sent with their dates and times stamped on them—to individuals, to a preset routing list, or to public bulletin boards—with RSVPs that advise the sender if and when they were read. You can easily reply to and forward messages throughout the network by appending a response to an existing phone message or memo. And since the message-center Mac is never shut off (except during maintenance on the system), messages continue to be logged even when the recipients' Macs are turned off. Furthermore, users can access their messages from any Mac on the system with their personal key disks. Icons at the bottom of the *InBox* window allow you to print your mail, save messages as text files, or delete them.

Finally, each personal connection allows for various sign-up and notice options: you can set up the system to automatically enter your name and password during log-on; change your password so that not even the administrator knows it; and designate whether you want to be notified audibly, visually, or repeatedly of incoming messages. A log may be printed of incoming and outgoing messages.

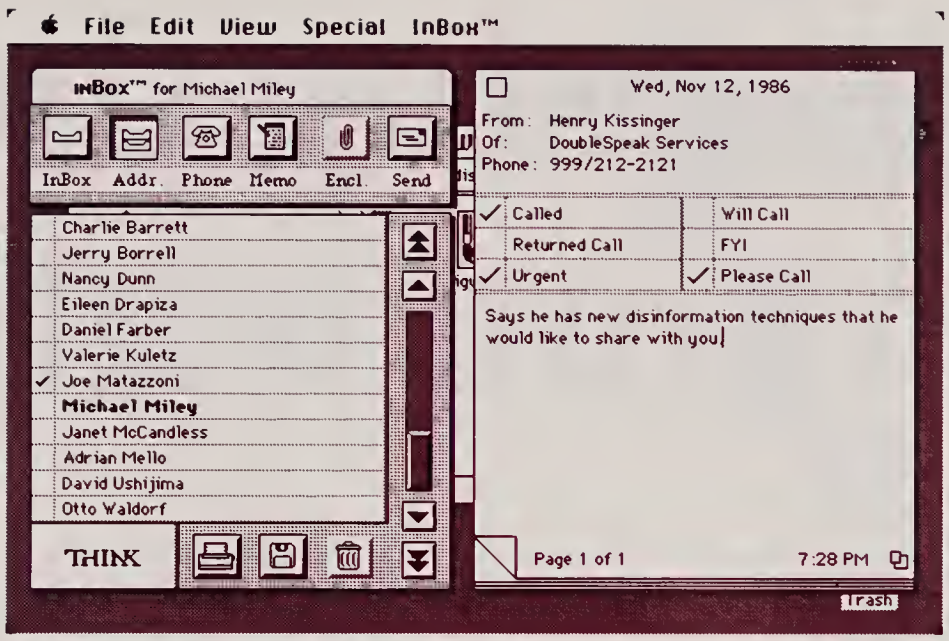


Figure 1
The InBox *mailbox lists the date and time a message was sent, along with the names of senders or the locations where mail may be read. In this sample, clicking on "The Bulletin Board" message opened the memo on the right.*

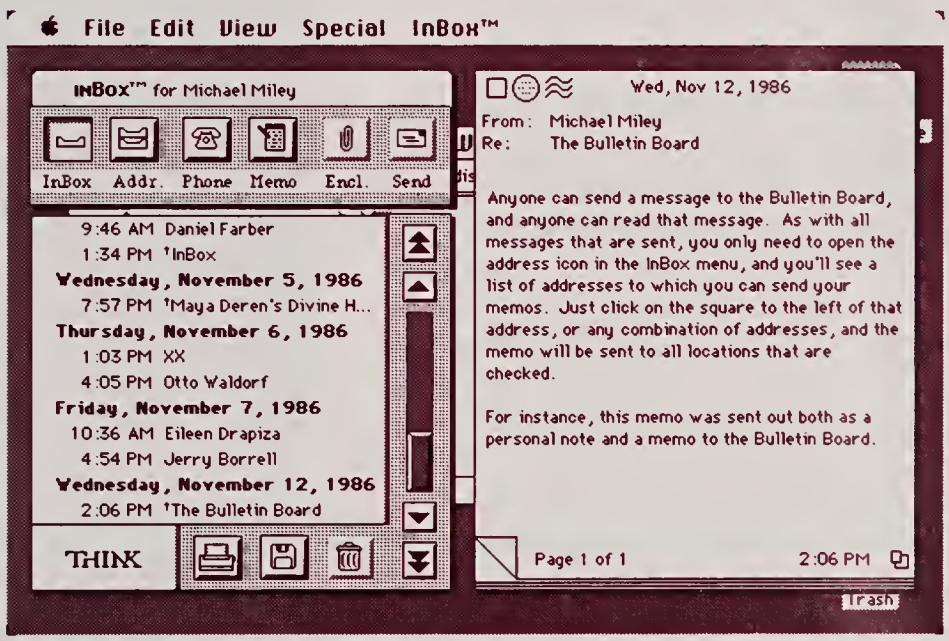


Figure 2
With this typical InBox *address list, calling up the addresses on the left allows you to send your message to all the people you've checked off. The phone message on the right uses standard phone-pad labels, but these can be customized.*

Putting InBox to Bed

The system can be left running for long periods. You can run a special data-compression routine during off-hours to reclaim lost disk-storage space. Administration of the network, if required, can be accomplished from any Mac on the system except the message center itself. A warning message is sent to all users approximately five minutes before shutdown. After shutdown, individual mailboxes may be backed up onto disks.

You must contend with some limitations, however, most notably that you cannot have more than one message center per network, and in the version we tested, the center has to be a Mac dedicated to that purpose only. Think Technologies also points out that *InBox* has compatibility problems with some applications, including *Excel, ThinkTank,* and *Jazz.*

In addition, we discovered these minor shortcomings: the administrator cannot create more than one file for your messages; all message-center files must be in the same folder for HFS and in the same volume for MFS; *InBox* must be the start-up application on all connections; and finally, when a Mac on the network hangs up, you must turn it off rather than use the reset button, which may require a response from everyone on the system—especially if the Mac is being used for administrating the network. Think Technologies is well aware of these limitations, and even points out some of them in its documentation.

Your Ticket to Route

Despite these minor quirks, *InBox*'s potential is considerable. We used it extensively without encountering any major problems. Data transfer is fast, and upon posting, the data is immediately written to the message-center disk so that it can't be lost. We liked being able to leave messages without having to worry about whether a Mac was receiving them at the other end.

Although the program is confined by AppleTalk to 32 users per network, up to one hundred personal connections are possible with the use of products like the Hayes Interbridge.

Although users of small networks may find *InBox*'s price prohibitive ($295 for the start-up kit, plus $75 for each additional connection), large-network users will probably soon wonder how they ever managed without it. Making it even more inviting are several recently introduced features that allow for systems with multiple message centers, message routing over linked networks, and communication between Macs and IBM PCs. Truly, Mac E-mail has come of age. □

See *Where to Buy* for product details.

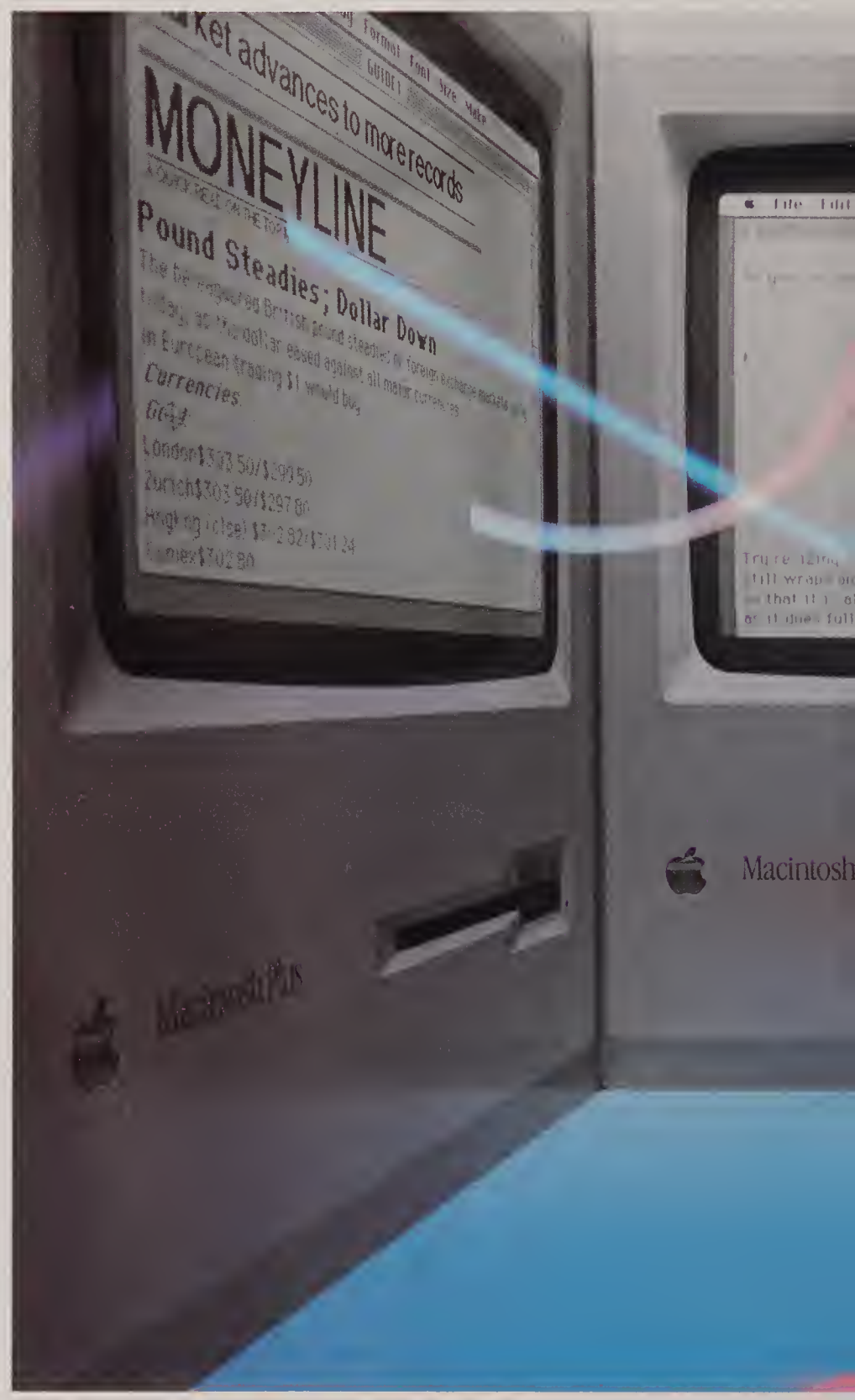
Glimpsing the Future with Guide

by Robert C. Eckhardt

A biologist sits in front of her Mac, reading a research paper in a recent issue of *Ecological Monographs (Electronic Edition)*. Composed of only a small number of summary paragraphs, the paper looks surprisingly short. But as she finds summary sections of particular interest, the biologist expands them to reveal detailed descriptions simply by clicking the mouse. Encountering a term she is unfamiliar with, she presses a key and a definition appears on the screen. When she comes across several organism names that she doesn't recognize, she presses a key, and the standard reference work on the group of animals in question appears. The biologist quickly finds the information and illustrations she needs, and then returns to the paper, right where she left off...

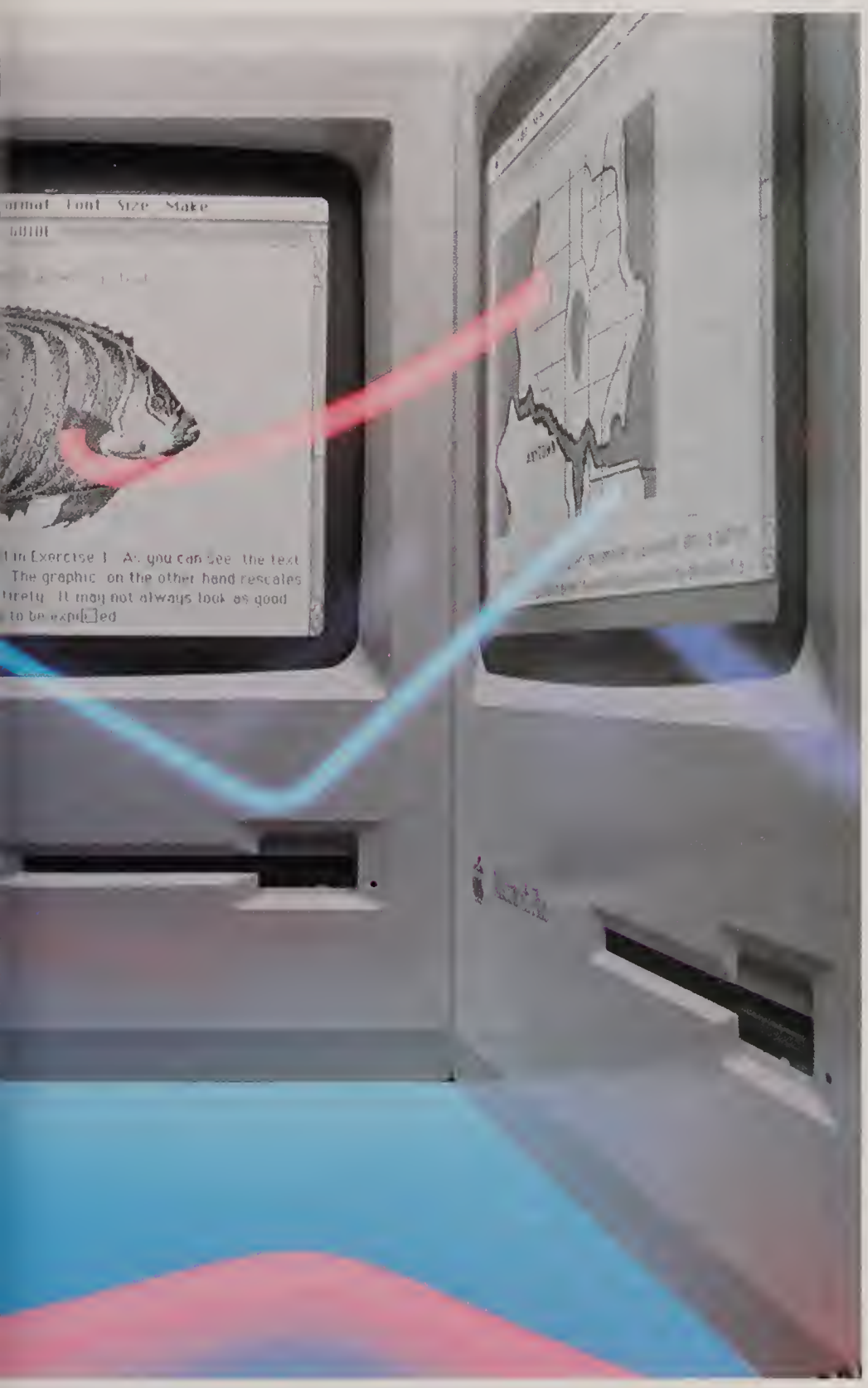
This is *hypertext*. First envisioned in the 1960s by computer maverick Ted Nelson, hypertext is an electronic system for organizing and presenting information. Linking, referencing, backtracking, and querying are all capabilities of hypertext, which is not constrained by the boundaries of a page or the binding of a book. In theory at least, instead of forcing our thoughts to fit the necessarily sequential format that paper imposes, hypertext makes it possible to structure our reading and writing nonsequentially, to fit the way we think and what we are thinking about. Today, roughly 20 years after Nelson first described it, hypertext has become a reality. Or has it?

Described by its publisher (OWL International) as "Hypertext for the Macintosh," *Guide* is the first serious attempt to bring the concept of hypertext to a personal computer. Superficially, *Guide* looks like its electronic antecedents, word processors and outliners, yet it is actually a wholly new type of software in the



DAVID BISHOP

A new program designed for reading and writing electronic documents



best tradition of Macintosh software innovation. But is *Guide* true hypertext? Even more important, is it useful? To determine just what *Guide* is and what it can be used for, we need to look first at what it does (and doesn't do).

Guidelines

With *Guide,* you can create documents (called *Guidelines*) that behave in much the same way as the electronic research paper described in the opening paragraph. The constructs needed to achieve this flexibility are relatively simple, and they have a simple name–*buttons.* Buttons are nothing more than pieces of text or graphics that have been given special abilities. There are three types of buttons. Replacement buttons, when clicked on, reveal new text, graphics, or other buttons. Reference buttons link the reader to other parts of the current Guideline or to other, related Guidelines. And note buttons display text or graphics that expand upon the text within the button, but only as long as the mouse button is depressed (see the "Guideline" figures). Each type of button can have a distinctive font style, such as bold or italic. In addition, the pointer turns into a special symbol when it is over an active button, so there's no mistake about where, and when, to click. You can rehide replacement text or graphics by clicking the mouse button a second time, or you can backtrack through a Guideline (for up to 32 previous button actions). You can also fold a hopelessly complex Guideline into its original form with the Top Level command. So long as a Guideline is clearly written and logically constructed, it should be easy to navigate. Although hypertext is designed to be read on screen, a Guideline can be converted into a *MacWrite* document.

Building a Guideline (and it is more like building than writing) is not as difficult as you might think. Text can be entered directly from the keyboard, copied from text-only files, or imported via the Clipboard. Once the text for a button has been entered, you select it, pull down the Make menu, and select the type of button you want. To create a replacement, you enter or paste in the new text. One or more replacement buttons and the surrounding text can be lumped into an *inquiry,* so that the entire block of text, not just the button, is replaced when the button is clicked.

Special Options

There are all kinds of options for what buttons look like and what they do. You can, for example, select a distinctive font style for each kind of button, have the program draw a small box around each one, or leave them undifferentiated from the rest of the text. Replacement buttons, despite their name, can remain on screen together with the replacement material or disappear when clicked. Normally, a blinking box surrounds replacements and references for a second or two when they first appear, but you can turn the box off if you prefer. And you can specify that replacements begin at the top of the screen or start wherever the button was when it was clicked.

To help you keep track of what you've done, the Show Symbols command places markers around everything but plain text. The Freeze command immobilizes all previously created buttons and replacements so you can edit their contents. The Font, Size, and Format menus allow you to change the font, font size, and style for each type of structure (button, replacement, definition, unstructured text, and so on) but not for individual words or characters.

Graphics can also be used in *Guide* (as buttons, definitions, or simply illustrations); they must be imported via the Clipboard. A button can contain a single graphic element, and multiple graphics buttons can be placed side by side (or even on top of one another) to create complex images.

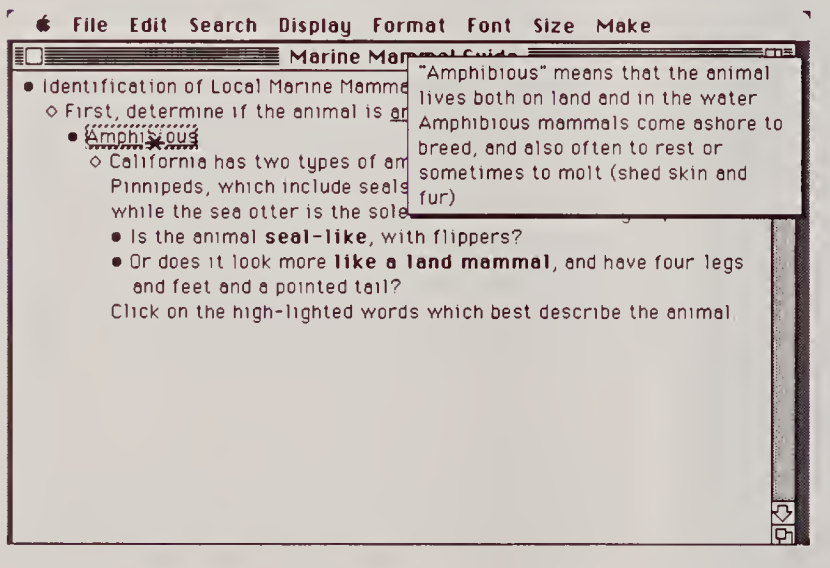
A Guideline Sampler

Guidelines can take on almost any organizational structure. They can be rigidly and predictably hierarchical, can branch in random or arbitrary ways, can loop back to previous sections (once or many times), or can take the form of a web (every part connected to every other part). This flexibility is what gives *Guide* its power and distinguishes it from word processors and outliners. Just what this power can do is not obvious, however—at least not at first. A few examples may help.

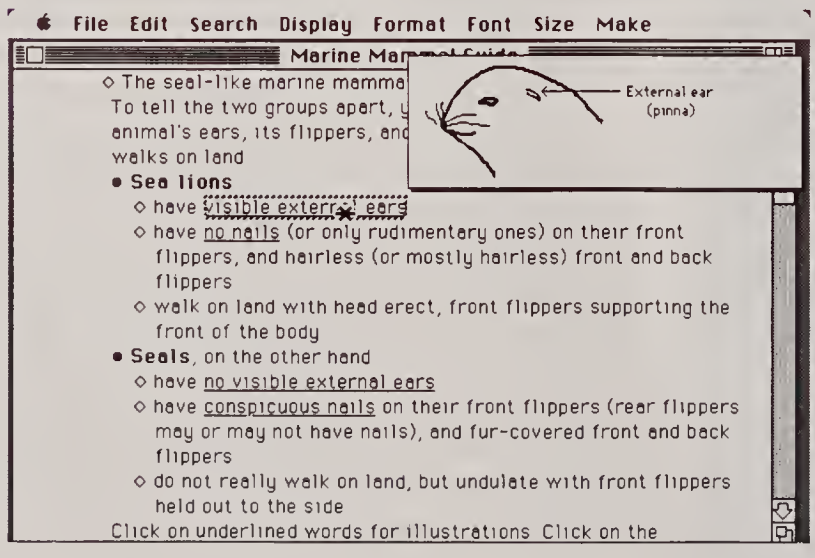
Guide could be used, for instance, to create interactive versions of identification keys. For centuries biologists have used keys to identify previously classified organisms. But keys are difficult to work with, because you must often consult other references for help and because keys branch frequently, making the reader jump from this page to that, until the logic of the identification process is almost impossible to reconstruct. On the other hand, a single Guideline key could contain within it or have links to every reference the reader needed.

Guidelines can also be created for instructional purposes. *Guide* comes with several explanatory *tours;* you can make other Guidelines for any kind of self-paced instruction. Complex Guidelines could be read and reread a number of times, revealing more as the reader's understanding and interest increase. The follow-along illustration used in the *Guide* manual is of a mundane sort—a sales report—but it reveals another, related property of *Guide* documents: a single electronic document now serves where two or more did before, since details, supporting material, and asides can all be hidden from view until called up by the person intended to see them.

With *Guide,* you can construct monthly calendars with as many cross-references to other days and months as you like (a calendar construction kit comes with the program). Maps can be nested many layers deep, so that readers can see the big picture, click on the area they want to see in more detail, and then click



Guideline 1
The word "amphibious" is a note button; so long as the mouse button is depressed while the pointer (which changes to an asterisk) is over the word, the definition window remains on screen.



Guideline 2
The "seal-like" replacement button in the previous figure was clicked to uncover this, the next step in the Guideline. The "sea lions" and "seals" buttons lead to more choices concerning the identification of individual species.

on a part of that map, and so on. Individually tailored help files can be created for and used with any application by means of the desk accessory Guideline reader, called MiniGuide, which accompanies the program. And, of course, the way is now open for a new kind of literary work that is nonsequential and hence rarely the same for different readers.

Is It Hypertext?

While it can't be denied that *Guide* is an original program with a wide variety of potential uses, the question remains: Is it hypertext? On a very limited scale, the answer is yes. But hypertext as Ted Nelson conceived of it wasn't limited the way *Guide* is. Although the concept is now 20 years old, the kinds of links and uses Nelson originally envisioned for hypertext are still well beyond the grasp of a single program on a desktop computer. To achieve true hypertext capabilities, either your Macintosh would have to hook up to a massive data bank organized in hypertext fashion, or you would need a small library of CD ROM disks organized as hypertext. But there are no hypertext data banks, and CD ROM is still more dream than reality. Thus, for the foreseeable future, all the replacements, definitions, references, notes, and other information within or linked to a Guideline must be entered into the computer by hand. Your hand, probably.

Unfortunately, not only is the creation of Guidelines labor-intensive, but *Guide* is hampered by several flaws. For one, *Guide* makes text entry awkward at best and text formatting next to impossible. Although *Guide* is neither a word processor nor an outliner, it should have many of the qualities of these two applications so that a writer can enter text easily and format it to look however he or she wants. It is, in fact, easier to enter text in a word processor or outliner and then import it to *Guide* via the Clipboard than it is to enter it directly into the program.

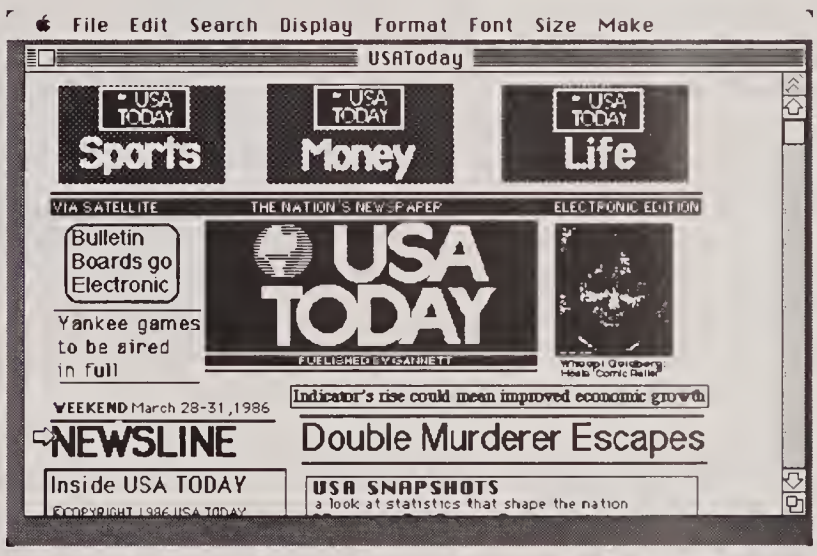
And because of *Guide*'s dearth of text-formatting options, if you want anything other than simple, left-aligned paragraphs, you must format each and every line of text using tabs and spaces. In addition to the considerable effort involved, this type of manual formatting gets thrown completely askew simply by resizing the window.

Another significant problem is the lack of a good Guideline reader. The need for a reader is twofold. First, just as readers of the printed word do not need a Linotronic printer to read a book, readers of the electronic word shouldn't be forced to buy a copy of *Guide* just to read a Guideline that interests them. Equally important is the fact that Guideline authors, like all authors, need some assurance that their work will not be altered. With the printed word, undetected alterations are hard to make. But until they can lock a Guideline to prevent unauthorized alterations, established authors will be reluctant to publish in *Guide* format. The solution, of course, is a low-cost, or no-cost, reader. *Guide* does come with a read-only version, MiniGuide. But MiniGuide is not sold by itself, nor can it be given away by Guideline authors along with the fruits of their labors. Furthermore, MiniGuide is a desk accessory and thus not very convenient for the occasional reader. And because window size can have a detrimental impact on formatting, the fact that MiniGuide's window can be resized at will means that Guideline authors have no control over the appearance of the finished product.

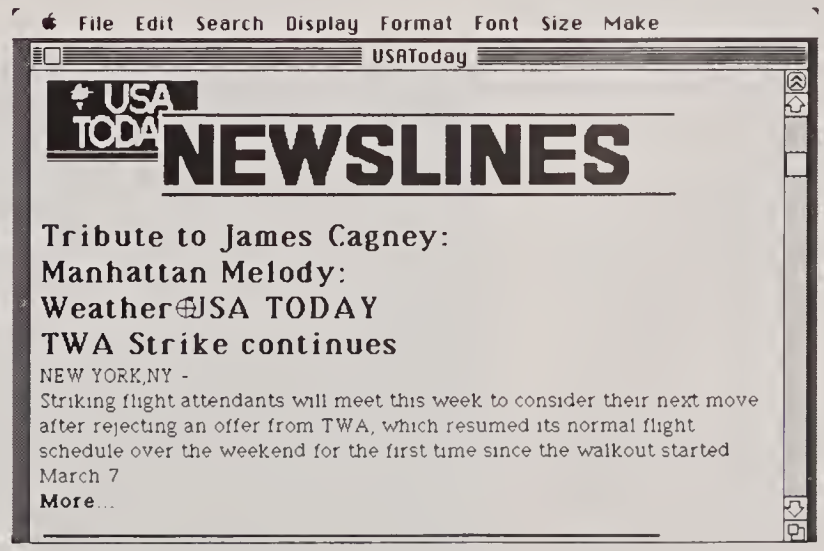
To solve this problem, OWL International plans to introduce *Guide Envelope,* a utility that allows you to send read-only *Guide* documents on electronic mail systems. You won't need *Guide* to read the Guidelines, and you can cut and paste text and graphics from the document.

Despite these shortcomings, *Guide* is an intelligent and encouraging first step toward true hypertext; the program is well worth exploring even if you aren't likely to find all of Shakespeare linked to a single sonnet. *Guide* already has enough power to recommend it for a wide variety of uses, and like many ground-breaking programs, it contains enough new ideas to keep even the dullest imagination busy for some time. Also like other innovative programs, it needs more work. By bringing a dream one step closer to fruition, *Guide* points the way to the future. But *Guide* hasn't taken us all the way there. Not yet. □

See *Where to Buy* for product details.



Guideline 3
With Guide, *you can place graphics anywhere on the page and make each graphic element a button. In this electronic mock-up of* USA Today, *virtually every element in the opening screen is a replacement or reference button.*



Guideline 4
Clicking on "Newsline" (from the previous figure) lists 18 headlines, each one a replacement button leading to more information. The TWA strike story contains this summary, for example, plus further details under the "More" button.

Reviews

Desktop Publishing with a Twist

Ragtime *0.991*

Integrated page processing. ***Pros:*** *Integrates spreadsheet with standard desktop publishing capabilities—page layout, word processing, and graphics.* ***Cons:*** *Lacks power and elegance of standalone products in page layout and spreadsheet modules.* ***List price:*** *Version 1.0 $395.* ***Requires:*** *512K.* ***Copy protection:*** *Key disk.*

Desktop publishing programs are a kind of integrated software combining page layout and word processing. You can import and manipulate graphics, but you can't create illustrations or charts. *Ragtime* from Orange Micro adds a new twist to the formula by incorporating a spreadsheet into its desktop publishing framework. If you need to integrate spreadsheets and financial documents in desktop publishing production, you'll appreciate *Ragtime*'s broadened desktop approach.

The standard Mac interface is enhanced by a screen that can be split into as many as nine windows, allowing you to view different pages of a file or to monitor text flow from one column (or page) to another. You can open several files at once and cut and paste between them. The number of files you can open at once is limited only by the amount of available memory. If you produce lengthy documents such as magazines and books, file size is more likely to be limited by available disk space than by the software's 350-page maximum.

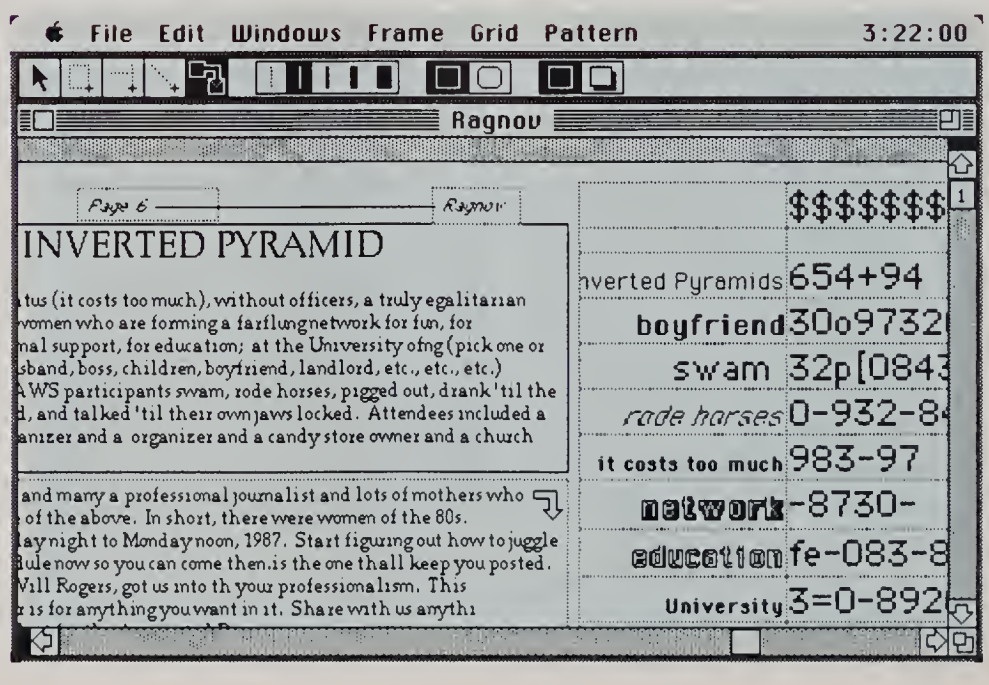
Page Layout

At the core of *Ragtime* are four basic capabilities: page layout, word processing, graphics, and spreadsheet. Interactive page layout in *Ragtime* closely resembles that of Manhattan Graphics' *ReadySetGo*. You create frames by drawing boxes and then format them by selecting text, spreadsheet, or picture. Switching between the different frame types is quick and easy—clicking inside a frame displays the appropriate menu bar and a corresponding tool palette for each module. Frames or frame contents can be locked in place by selecting Protect Frame or Protect Contents, helpful features that minimize pasteup problems during page processing.

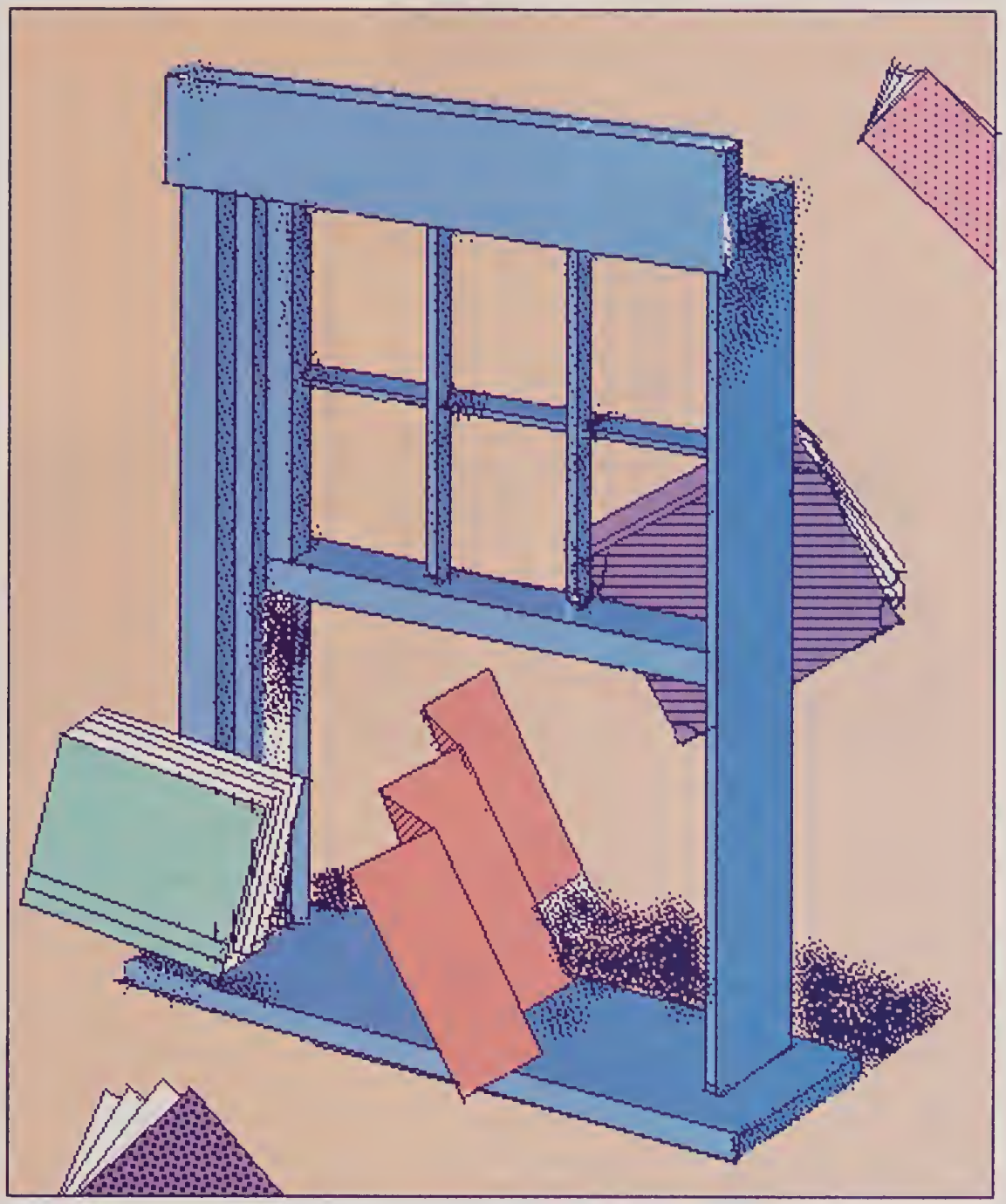
Mouse coordinates are displayed (in inches, centimeters, picas, or points) directly beneath the tool palette to aid in determining frame width and height. For exact positioning of frames on the page, *x* (for top and bottom) and *y* (for right and left) coordinates are also displayed.

Ragtime lets you choose between standard and custom paper sizes. The interactive Show Page option lets you see multiple pages in a reduced view and allows you to reposition frames on a page. The Duplicate command reduces the Copy and Paste routine to one keystroke. The Generate Form option creates a template from any page layout, which can then be used by either "tearing off" a new page or placing it within another document. For example, the layout of a business contract or letter can be saved as a form and modified for future use. You can also save individual frames, such as headings or footnote areas, as templates.

Ragtime's page layout tools are geared to managing simple layouts and long documents. Page layout tools allow you to draw frames and add borders, lines, or shadows. You can choose from eight fill shades, ranging from zero (white) to 100 percent (black). There is a 30 percent limitation on background shading for squares. The spreadsheet has a 1-point line where there should be a hairline for the line and column rows. Otherwise *Ragtime* offers lines from hairline to 4 points, with one



Page Layout Mode
Text and spreadsheet frames in a technical manual. The pipelining tool is highlighted in the text frame.



dotted-line choice. Only two shapes are available, a box and a rounded-corner box. A "pipelining" tool provides automatic flow of text between frames or pages, an important feature in managing complex documents. Pipelining is easy to do, although no trail is provided to enable you to follow the flow. However, you can keep track of pipelining manually by choosing Show Tags, which shows you a number tag for each frame.

Ragtime's page layout module has some shortcomings: it imports only unformatted text files, and it has no on-screen rulers and no page view sizes between Show Page and full-size—serious limitations if you're producing newsletters, fliers, or brochures. In addition, typesetting features like automatic hyphenation, kerning, and vertical justification are not available.

Word Processing and Graphics

Ragtime has most of the standard text editing features found in desktop publishing word processors, including Search/Change, font sizes from 4 to 127 points, leading in points, and expanded, condensed, and reversed text.

Also included are automatic date, time and page numbering and global formatting—making font and style changes to part or all of a document. For example, you can globally change headings, subheadings, or all of your subscript items.

Producing long documents and books is simplified with *Ragtime*'s quick page insertion, automatic text flow, and text importing and exporting. Technical publications are easily managed due to the flexibility of multiple-column formatting. Rulers within columns allow you to place columns within other columns, letting you arrange text around graphics.

You can import *MacPaint* or *MacDraw* (PICT) graphics directly into *Ragtime* and reduce them by 25 percent, 50 percent, or 75 percent; proportional scaling is also possible. Clip to Fit and Size to Fit are helpful for managing large numbers of graphics in long documents. They allow you to place an entire graphic element or a specific part of a graphic inside a previously positioned plane. And because picture frames are treated separately from other frames on the page, you don't have to repeatedly await bit-by-bit reconstruction of graphics when editing layouts that include text and graphics.

Spreadsheet

The highlight of page processing in *Ragtime* is the spreadsheet, which allows fonts and styles to be mixed on a cell-by-cell basis as well as formatted by number. While not as powerful as dedicated spreadsheet programs like *Excel, Ragtime*'s 253-column by 253-row spreadsheet has adequate functions (55 versus *Excel*'s 85) for day-to-day business management.

Large spreadsheets can be created directly in *Ragtime,* or you can display selected areas of a spreadsheet by adjusting the size of the spreadsheet frame (see "Page Layout Mode"). You can also interrelate data by linking multiple spreadsheets within a single *Ragtime* file. While there aren't any limitations to importing unformatted text, graphics, or numbers, you cannot import embedded formulas from other spreadsheets. The spreadsheet offers more options for formatting and linking than *Multiplan, Excel, Jazz,* or *Microsoft Works,* and has adequate capacity and calculation speed for general business use. The single biggest drawback is the lack of automatic options for creating charts or graphs.

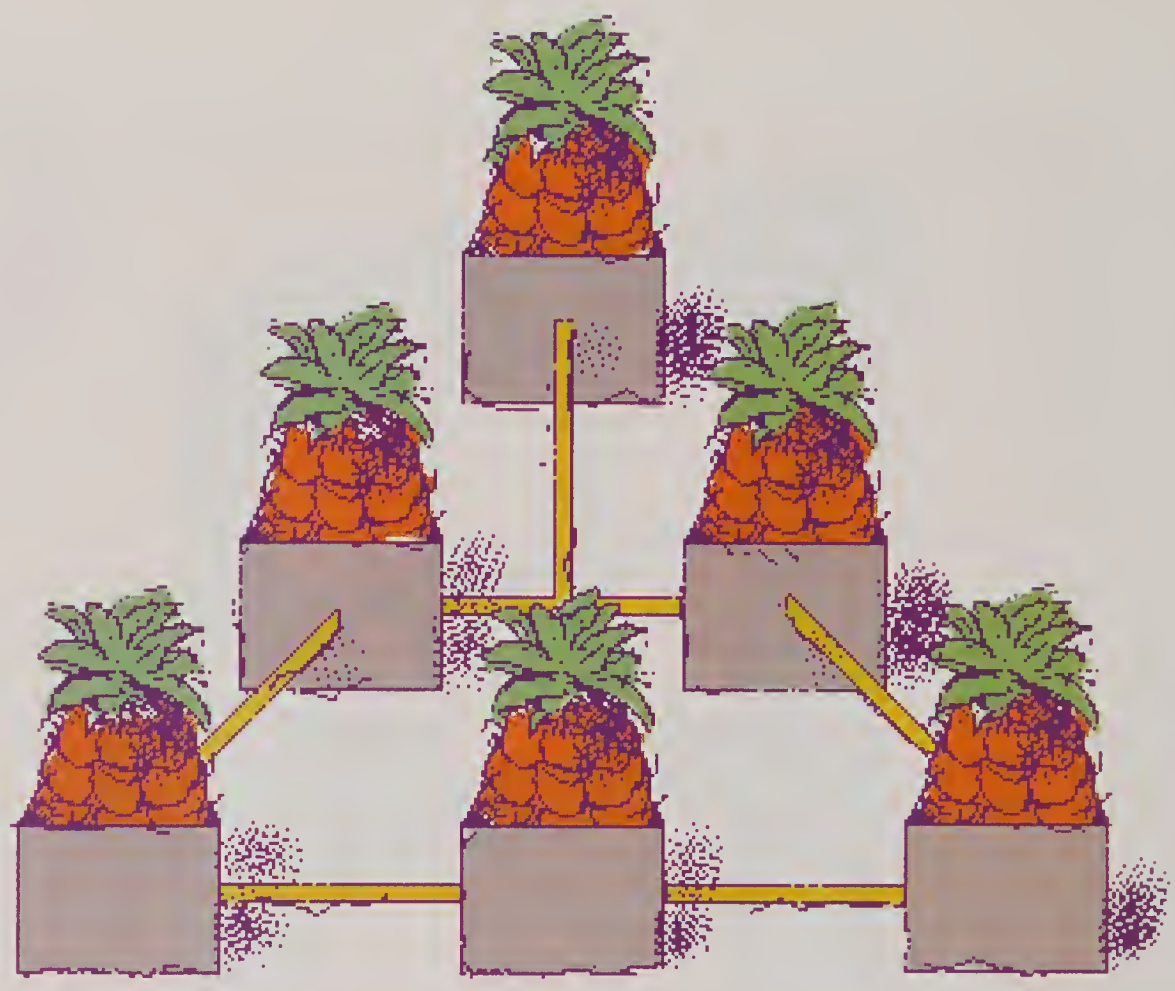
ILLUSTRATIONS BY MARK ULRICH

View from the Top

Ragtime lacks the elegance of dedicated page composition programs like Aldus's *PageMaker*. For publishing short documents–display ads, fliers, brochures, and the like–*PageMaker* is clearly more refined and flexible. But *Ragtime* produces long documents exceptionally well, and at $395, it packs a lot of power for your money.

Of course, *Ragtime* doesn't have the power of stand-alone spreadsheet or word processing applications, and its page layout limitations impede graphic arts tasks (such as creating illustrations or charts). However, it is a well-balanced, integrated desktop publishing program–its number-crunching power and page processing versatility are well suited for the production of business plans, financial plans, and technical documents.

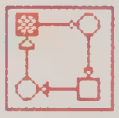
See *Where to Buy* for product details.



A Symbolic Outliner

Design *0.093*

Structured diagram system. ***Pros:*** *Well-organized, efficient system for flowcharts and organizational diagrams.* ***Cons:*** *Perhaps too sophisticated for casual users.* ***List price:*** *$200.* ***Requires:*** *512K.* ***Copy protection:*** *None.*



If you write programs longer than one page, belong to an organization with more than ten members, or intend to outline a project with more than three tasks, you will probably be delighted with the way *Design* helps you organize your efforts. *Design* is something like a graphical *ThinkTank*–it lets you arrange a series of related topics in a hierarchy and represents the hierarchy in familiar flowchart symbols. It handles text as well as graphics (for instance, you could use it like an outline processor) and provides some novel facilities for translating text into symbols. For advanced users, *Design*'s Open Architecture Development System allows the program to be used as a graphics kernel for specialized applications.

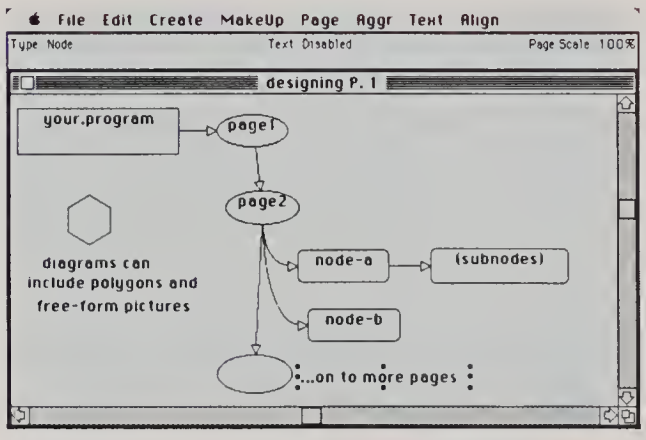


Diagram Structure
Design *provides a framework for linking different levels of diagrams and a library of logical symbols for flowcharting.*

The fundamental starting point is the diagram, made up of pages (see "Diagram Structure"). The first page typically shows a highly simplified version of a diagram, perhaps a handful of boxes and connectors. You can further specify each box, or node, at a lower level (the "child" substructure of the original "parent" node), then fill in the lower-order structure, and continue specifying structures until you are satisfied that your plan, program, or structure is described in sufficient detail.

It's the "intelligence" of the diagram that makes working with *Design* different from drawing boxes and arrows with *MacDraw*. *Design* links figures on the screen in program logic; the connectors between nodes are automatically redrawn when you make changes in the diagram, and the program remembers the hierarchical relationship between nodes across pages. Although in principle you can lay out a complex diagram, including substructures, using a simple drawing program, *Design* checks multipage diagrams for consistency, a great help when the structure starts to get complicated.

Text into Pictures

Production of flowcharts from programs, a chore in *MacDraw*, is fast and easy in *Design*. *Design* can take as input the text file of a Pascal program like this:

```
program (Macworld)
  -
    -
      begin.....
          begin....
            -
            end
      end.
```

and automatically produce the corresponding flowchart. This trick is accomplished by specifying "begin" and "end" as delimiters. As the text file is read in (using Load Text from the *Design* File menu), the program notes the pairs of delimiters, places enclosed text in a rectangular node, and arranges the boxes in a parent/child hier-

archy corresponding to the begin/end hierarchy of the program text.

This method works for C-language code as well (using { and } as delimiters) and can also be extended as a text-to-diagram translator for most kinds of documents. By picking suitable delimiters (#'s and $'s are convenient), you can write a description of a customer identification database or an office organization that will translate itself into a multilevel *Design* diagram.

Seeing the Structure

One fundamental and unique feature of *Design* is an operation called Coarsen. Coarsening is a way of reducing the complexity of a page on screen by collecting objects and replacing them with a single node called a coarse node. The detail in the node then appears in a new subpage one level lower in the tree structure. Thus, after a long program has been translated into a diagram, it can be further simplified by coarsening to show a set of main program features on the first diagram page, with subsequent subpages filling in the program detail. The Coarsen operation makes diagrams more readable without sacrificing their completeness (you can always double-click on a coarse node to see the detailed structure; *Design* moves you to the appropriate subpage).

Smaller Points

Design includes some nice touches for diagram graphics. You can create a special node called a Picture by pasting a picture from an outside application into a node via the Clipboard. Picture nodes can be moved and connected just like ordinary text-labeled nodes. The connectors themselves can also be curved and have multiple segments; this is helpful in graphic presentation of groups of similar items. The December release of the manual contains extensive step-by-step notes on applications and a tutorial for those new to flowcharting. In summary, *Design*'s "symbolic idea processor" is a high-quality professional system for conceptual diagramming, useful in both programming and general systems analysis.—*Charles Seiter*

See *Where to Buy* for product details.

Low-End Accounting from a High-End Vendor

BPI Entry Series General Accounting *1.0*

Accounting program. ***Pros:*** *Straightforward; easy to learn and use.* ***Cons:*** *Marginal documentation; doesn't work well with the LaserWriter.* ***List price:*** *$249.* ***Requires:*** *512K.* ***Copy protection:*** *None.*

BPI Systems is best known for its series of high-end accounting software for IBM PC compatibles. But its first entry into the Macintosh market is a low-end general accounting package for small businesses. Essentially, the entry-level package is a general ledger module with some additional accounts payable, accounts receivable, and payroll functions.

General Accounting has six journals—cash receipts, cash disbursements, invoices, purchases, a cash register, and a general journal. The cash register journal is for businesses that need to reconcile one or more cash registers. In addition, there are four master files—vendors, customers, employees, and miscellaneous payers/payees. Each master file entity has a four-digit code. General ledger account numbers are limited to four digits, or three if you use departments (the last digit of each account becomes a department number).

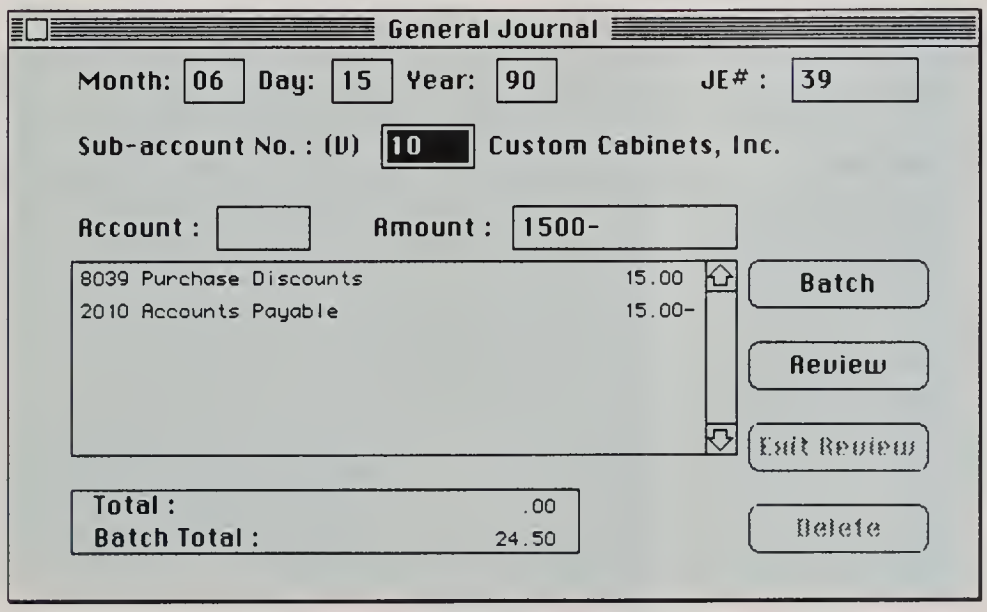
Overall, the program is very simple to use. The invoices journal is like a limited accounts receivable. You can't actually print invoices or statements; you add them to the invoices journal and apply cash receipts to them later. There is no accounts receivable aging report. The disbursements module prints checks for any name in the master files, giving you a simple payroll capability.

The program tracks almost no information about any of the master-file entities. Current-period and balance-forward totals for customers and vendors are printed on reports but cannot be viewed during master-file maintenance. There is no provision for customer or vendor addresses—you actually have to enter the payee's address whenever you print a check. The program does track current-period, quarterly, and annual payroll amounts for each employee, giving you some payroll-reporting capabilities.

Business as Usual

In spite of its simplicity, *General Accounting* can handle most normal accounting events, and each transaction can have 8 to 12 detail lines. The program handles credit memos for vendors and customers, one-time miscellaneous disbursements and receipts, and void and manual checks. You can specify which invoices are to be paid with a printed check. The program lets you maintain a set of automatic recurring general journal entries that are posted once a month. You can also load transactions from an external text file, a feature that should be used with extreme care. *General Accounting* is fully integrated—once entered, a transaction is automatically stored in all the appropriate places. There is no separate updating or posting step.

General Accounting includes a good set of reports. It offers all the basic finan-



General Journal Window
The General Journal window is typical of most General Accounting *transaction entry functions. The transaction information is entered at the top of the window, and individual detail lines appear in the scrollable window.*

cial statements—trial balance, income statement (consolidated and departmental), balance sheet, and a variety of audit trails. To a certain extent, you can specify the lines that are printed on the financial statements. All reports can be printed to the screen, the printer, or a disk file. By including a simplified print queue capability, the program gives you control over printing. Checks can be reprinted in case of a paper jam or another problem.

Most of the program's data entry windows are similar to the general journal window (see "General Journal Window"). You enter the primary information at the top, followed by one or more transaction detail lines. Transactions are batched, and you can review and modify a batch until you click the Batch button.

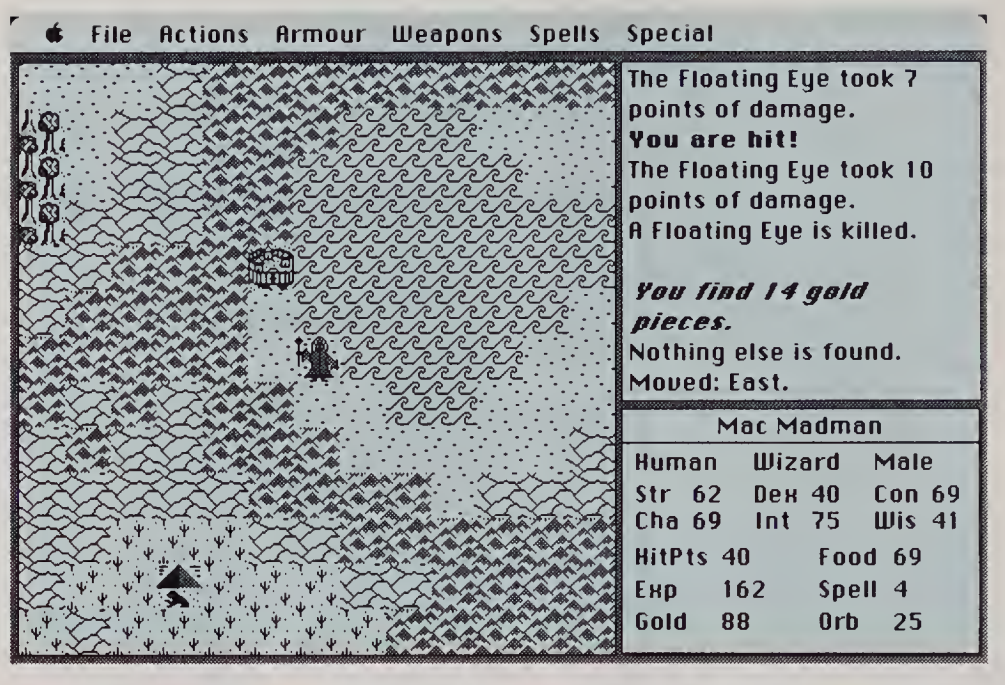
A Quick Study

The program is easy to learn and use for a variety of reasons. The menu choices are straightforward and clear, and there's never any question about what the program can and can't do. The windows are cleanly designed in a large font. There is no visual clutter. The program functions are consistent. When you enter a check, you can make it payable to any master-file entity, not just customers or employees. You can also receive cash from sources not listed in the master file. Finally, you can understand everything the program does in an hour or so.

General Accounting does have a few problems. The lack of illustrations in the documentation makes it difficult to understand the manual, particularly the chapter on how to set up your own company. The reference section is only 32 pages. Also, there's no way to use an existing chart of accounts when you set up your company—a major problem if you're automating your system for the first time. The program's printing function, which depends on a user-defined queue, doesn't work well with a LaserWriter, and it's easy to make the system crash with a LaserWriter.

General Accounting compares favorably with products like *Back to Basics* and *TurboMaccountant*. However, BPI should extend the program's capabilities to include at least invoice printing, a receivables-aging report, and storage of more historical information in the various master files. *General Accounting* does include a separate export program that lets you create SYLK files from the master files and the chart of accounts, but that's not quite enough. From a long-time, high-end accounting software veteran like BPI, I expect a little bit more.—*Steve Mann*

See *Where to Buy* for product details.



Graphic Adventure *Wizard adventurer "Mac Madman" leaves a village between mountains and water to seek the secrets of the pyramids.*

Graphic Adventure

OrbQuest: The Search For Seven Wards *1.02*

Fantasy role-playing adventure game.
Pros: *Well-executed popular game format.*
Cons: *No real surprises for veterans of similar games.* ***List price:*** *$49.95.* ***Requires:*** *128K.*
Copy protection: *Not copyable.*



For devotees of fantasy role-playing adventure comes *OrbQuest: The Search for Seven Wards*. You seek a magical orb shattered into seven parts, the *Seven Wards,* which must be gathered from far and wide to restore the orb and defeat evil. *The Search for Seven Wards* takes place on a map of challenging scale—sprawling mountain ranges, great rivers, huge forests and treacherous marshlands, a dozen cities and villages, and other locations crucial for a mouse-driven little character to explore. You choose your character's name, sex, and occupation, and the program randomly assigns your character six other values, such as strength, intelligence, and charisma; these values can be enhanced or reduced during play. The landscape fairly crawls with icons representing monsters and villains—including the IRS, whose savage agents grab your character's gold.

The best feature of *OrbQuest* is its grand scope: the great distances to be traveled and the exhaustive search, which is the essence of a good quest. Unfortunately, the game lacks imaginative twists. There is little need for strategic thinking. An experienced player may find *OrbQuest* too familiar, too straightforward, and derivative of more creative predecessors. For example, *Ultima II* has been available for about two years and remains a superior game in most respects (as does *Ultima III,* with its four-player teams and mapping that blocks the players' view around corners and over mountains). First-time adventurers will enjoy *OrbQuest* more than jaded game addicts.

Despite these criticisms, *OrbQuest* is easy to understand, fun to play, and not an easy win. Modestly packaged, it suffers none for the lack of posters, arcane writings, and other fantasy game doodads.

OrbQuest: The Search for Seven Wards does not advance the art and science of digital adventuring but does offer a hide-and-seek game of substantial breadth. It may hold the promise of better things to come in future games (including a sequel to this one) planned by the *OrbQuest* folks.—*Keith McCandless*

See *Where to Buy* for product details.

Two Tape Backup Systems

***T-20** 2.2*

SCSI tape backup system. ***Pros:*** *Versatile backup program; restoring consolidates fragmented files for improved disk performance.* ***Cons:*** *Relatively complex backup program; somewhat slow performance; restore process deletes Get Info comments.* ***List price:*** *$895.* ***Requires:*** *Mac Plus or 512K Mac with SCSI adapter.*

***TDBK-20 +** 1.0*

SCSI tape backup system. ***Pros:*** *Fast and virtually foolproof.* ***Cons:*** *Backup program lacks incremental backup capability; restore program doesn't consolidate fragmented files.* ***List price:*** *$1095.* ***Requires:*** *Mac Plus or 512K Mac with SCSI adapter.*



FRED STIMSON

Hard disk owners are like motorcycle riders: either they've been down or they'll go down. To survive, you must ride defensively and be prepared for the worst. So forget wild stunts in traffic, always wear a helmet, try experimental software on expendable disks (disconnect your hard disk), and back up files frequently. If you don't have two or three hours during the day or week to back up a 20-megabyte drive onto 25 double-sided floppy disks, you need a tape backup system. It cuts backup time to 10 or 20 minutes in most cases.

Two tape backup systems currently available are the TDBK-20+ from MDIdeas and LoDown's T-20. Both attach to the SCSI port on a Mac Plus or to a Mac 512K Enhanced via a SCSI adapter (see "SCSI Ports for the 512K Mac") are sized to fit under the Mac. They can store 22 megabytes on a Teac CT-500 tape cassette ($18 to $20), which looks like an audio cassette but isn't interchangeable with one. Longer tapes that hold up to 30 megabytes are also available. Although these two drives and many others use the same type of cassette, they record information differently on tape. Don't plan to exchange information with others by trading tapes the way you trade floppy disks, unless all parties have the same brand and model of tape drive.

The manufacturers claim their tape drives will back up anything that appears in the Finder as a volume and uses one of the standard Mac file systems (hierarchical or flat). This includes backing up SCSI disks, the Apple Hard Disk 20, serial-port disks, and even disks on an AppleTalk network (though the last would be very slow to back up). I had no trouble using either tape drive with the disk drives I had available: a DataFrame 20, a Peripheral Land PL-20, and an Apple HD 20 (disk port version). Both tape drives work with any size disk drive; if the drive is larger than 20 megabytes, the backup software tells you to insert additional tapes as needed. The time required to back up or to restore varied quite a bit, depending on which disk drive was involved, but MDIdeas' TDBK-20+ was consistently faster than the LoDown T-20 (see "Tape Backup Performance Chart"). Both drives performed reliably during a one-month test period.



FRED STIMSON

Backup Drive Hookup

Setting up the tape drives is fairly easy. You have to be careful to get the right cables, since there are two types of SCSI connectors used on SCSI devices for the Mac. The T-20 has two Mac Plus-style DB-25 connectors and comes with a cable that has a DB-25 connector at each end. The TDBK-20+ has two SCSI-standard 50-pin connectors and comes with a cable that has a DB-25 connector at one end and a 50-pin connector at the other. Which cable you need depends on the connectors your hard disk drive uses and the order in which you attach SCSI devices to your Mac.

Each SCSI device you attach must have a different SCSI priority number or you won't be able to start the Mac. Also, if you attach three or more SCSI devices to the Mac, the terminators must be removed on all but the two end devices. Both the TDBK-20+ and the T-20 have removable terminators and adjustable SCSI priority numbers inside their cabinets, so they can be set up for any chaining configuration by a dealer or another technician. Ask your dealer if you're not sure about cabling.

The backup programs provided with the two drives are polar opposites. The TDBK-20+ software is simple to use because it limits your choices to backing up

or restoring an entire disk. It's fast because it records the whole disk on tape as a single image, preserving files and folders even though it doesn't treat them separately in the backup procedure.

In contrast, the T-20 software abounds in options—so many that if you don't know exactly what you're doing, you can spend as much time selecting options as the T-20 takes to perform a backup or restore. For example, you can back up files that have changed since the last backup, files that have changed since the last full backup, or a whole disk. In addition, you can include or eliminate specific files.

The T-20 records a directory of tape contents on each tape. This overhead makes the T-20 somewhat slower than the TDBK-20+, but it pays off by improving disk performance when you restore. Then, any formerly fragmented files are saved contiguously on the disk so that the Mac can retrieve them more quickly. And since all available space is consolidated in one contiguous block, with software like *MacServe* that allows volume partitioning, you can add or expand volumes.

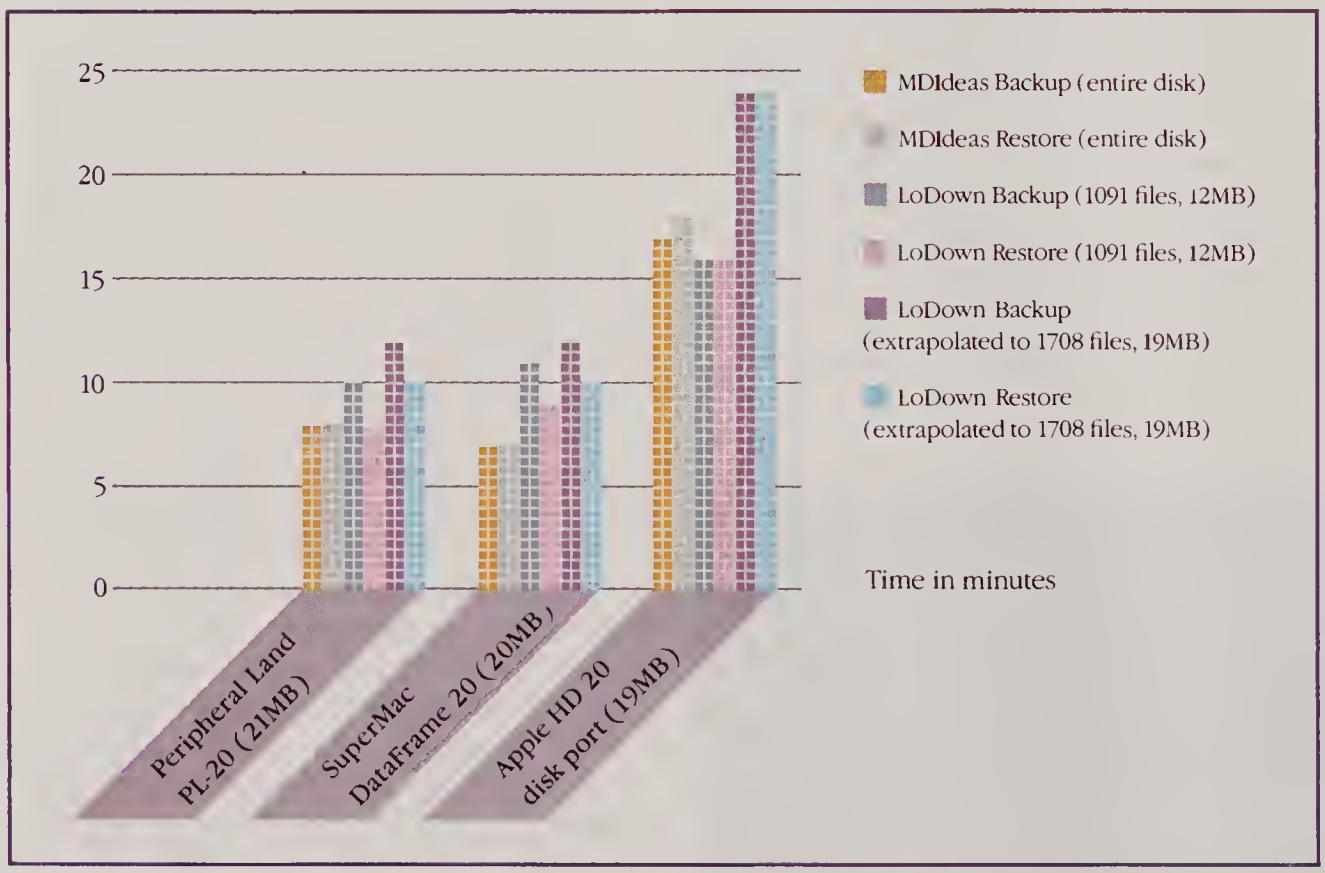
Taping the Bad with the Good

Disks rarely develop bad sectors, but when they do you'll want to be able to back up all but the bad sector, reformat the disk, and restore it from the backup. Both the TDBK-20+ and the T-20 can handle the bad-sector situation, provided the problem is not in the disk directory. However, the TDBK-20+ requires a second hard disk drive to complete the restore operation. (After backing up from the bad-sector disk, you must restore its contents on the second disk, reformat the bad disk, and then use the Finder to copy all files from the second disk to the reformatted disk, except those that contained bad sectors.)

During backup, the T-20 simply skips files that contain bad sectors, simplifying the restore process. Although this procedure works with most disks, LoDown states that some hard disk driver software causes a system error or somehow terminates the backup if the driver discovers a bad disk sector.

It takes less than a minute to accidentally erase an entire SCSI hard disk. Don't wait to learn the hard way. Decide which you prefer, LoDown's versatility or MDIdeas' simplicity, but get a tape backup system. The price is right when you consider the time you'll save over floppy-disk backup methods or (shudder) no backup at all.—*Lon Poole*

See *Where to Buy* for product details.



Tape Backup Performance Chart

The MDIdeas TDBK-20+ takes the same time to back up or restore regardless of how full the disk is or how many files it contains, whereas the LoDown T-20 takes longer as the number of files or space used increases.

dBase in a Mac Window

dMac III *1.10*

Relational database and application generator. ***Pros:*** *Powerful database system and application-programming language; high-level compatibility with IBM PC* dBase II, III, *and* III Plus. ***Cons:*** *Text-oriented programming; limited use of Mac interface; complex command and file structures.* ***List price:*** *$495.* ***Requires:*** *512K.* ***Copy protection:*** *None.*

You chose a Macintosh because it was "the computer for the rest of us," only to discover that the rest of *them* continued to use IBM PCs. One of the reasons was that *dBase,* the database standard of the PC world, simply didn't run on the Mac. Now *dMac III* from Format Software has changed all that. A PC-style program for the Mac, *dMac III* is a complete *dBase* clone that helps bridge the gap between "us" and "them." But if you're expecting a typical Mac product, beware. *dMac III* provides only a single fixed-size window and uses very few of the familiar Mac graphics, either for screen formatting or data elements. Although it's a powerful relational database system and application-generation language, *dMac III* is a business tool primarily for Macintosh users who need access to IBM PC *dBase* programs and data files.

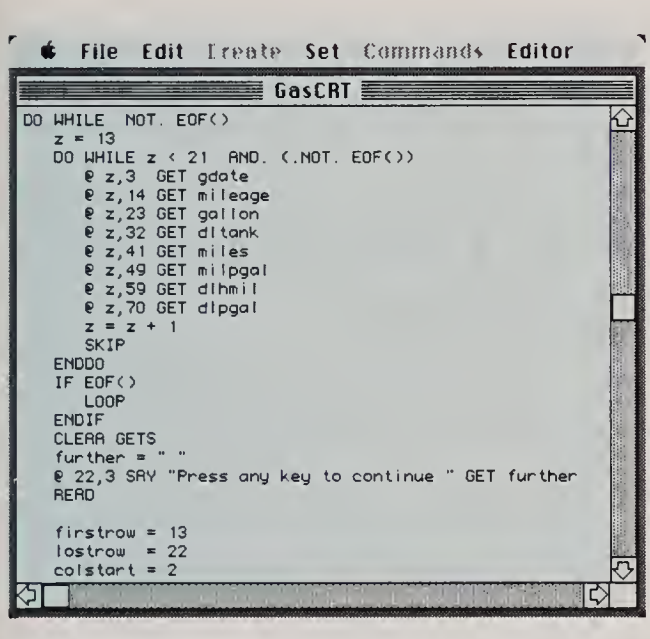
Bridging the Gap

If you're a *dBase* user who must frequently straddle the two very different worlds of the PC and the Mac, *dMac III* was designed for you. It's the only product available that allows two-way transfer of both program and data files between *dBase* and the Mac. Program and format files with .PRG and .FMT extensions can be interchanged between *dMac III* and *dBase* without conversion. The simple Convert command converts data files from *dBase II, III,* and *III Plus* to *dMac III* and can be used in both directions.

Conversion of ancillary files is the major roadblock to transferring applications between *dBase* and *dMac III.* Index (.NDX), Label (.LBL), Report (.FRM), and

Variable (.MEM) files are incompatible and must be rebuilt because of file structure differences between the two systems. The lack of a simple conversion utility for these files is a serious omission, since most users will probably find *dMac III* better suited for transferring applications between the PC and the Mac than for creating new Macintosh database applications.

The *dMac III* command language is identical to that of *dBase III Plus,* with very few exceptions; it even supports the Assist menu-interaction feature of *dBase III Plus.* In fact, the correspondence is so close that an experienced PC *dBase* user can easily use *dMac III* without referring to the manual. But for those who need it, the *dMac III* manual is thorough and well organized—with one major exception. The



No-Frills Interface

With text-oriented commands, few graphics, and a single fixed-size window, dMac III *will look strange to most Macintosh users, but if you're familiar with* dBase *on the IBM PC, you already know how to use* dMac III.

three-page appendix devoted to the differences between *dMac III* and *dBase* is a big disappointment. Since *dBase* compatibility is the reason *dMac III* exists, this important topic should have been given a much more detailed explanation, instead of being treated as an afterthought. On-line help is also available but is not context-sensitive; it's simply a series of brief extracts from the program manual.

Where Are the Graphics?

Though you do get simple cut-copy-paste editing plus menu and keyboard equivalents for common commands, *dMac III* is a text-oriented program that barely uses the familiar Macintosh interface. And since the clipboard used in *dMac III* is strictly internal, its contents are not available to other Mac programs. Format Software also includes the stand-alone Apple MDS Edit program with *dMac III* for more complex editing tasks.

Although you can use *dMac III* to create reports and mailing labels, you must first master a complex command language to write report-form programs. *dMac III* does things the *dBase* way, and that just doesn't include using the mouse to place fields, labels, lines, boxes, and pictures on the screen. You can use boldface and italics—as long as you're satisfied with Monaco 9; multiple fonts and graphic data items simply don't exist in the *dBase* world.

Compatibility or Simplicity?

dMac III may not be easy to learn, but it is a high-capacity tool that can juggle quite a bit of information. Database files can be as large as 32 megabytes and can hold up to 16 million records, while each record can have as many as 2000 fields. Ten database files can be open simultaneously, and each database file can have up to seven active index files. Since *dMac III* doesn't have the file-size constraints of *dBase,* it can convert even the largest *dBase* files. *dMac III* also excels in speed comparisons. Although exact timing comparisons are difficult because of differences in hardware and operating systems, *dMac III* performs most operations (including compiled programs) much faster than *dBase III Plus* running on an IBM PC XT or AT.

In the Mac database arena, *dMac III* has three major competitors: *Omnis 3 Plus, Helix,* and the recently announced *dBase Mac* from Ashton Tate, the creators of IBM PC *dBase.* (There are other excellent Macintosh database programs, but they lack the ability to create stand-alone relational database applications.) The choice between *dMac III* and its competitors boils down to PC *dBase* compatibility versus ease of use. Mac users unfamiliar with *dBase* and PC-style computing will find *dMac III* difficult to master, even with the manual.

Nevertheless, *dMac III* may be the wedge that helps push the Macintosh into organizations that previously were the IBM PC's exclusive domain, since it's the only program that can transfer large, expensive corporate *dBase* systems directly to the Mac. And if the multiuser network version promised by Format Software is actually released, it could represent an important link in a Mac-IBM network.

dMac III is the closest thing to IBM PC *dBase* on a Mac—that's the good and the bad in one sentence. It's a complex PC-style program that operates in a way foreign to most Macintosh users, so unless *dBase* compatibility is your major concern, stay away. There are better choices for developing new Mac database applications. If you need only data-file compatibility, you might want to check out Ashton Tate's *dBase Mac,* a new Macintosh-style product that's easier to use than *dMac III* but can share only data files with IBM PC *dBase.* For a high degree of program and data compatibility with *dBase, dMac III* is the only choice. *—Larry-Stuart Deutsch*

See *Where to Buy* for product details.

Mac Video Production

Desktop Video System

Effects creator. ***Pros:*** *Allows transfer of Macintosh image to standard TV, monitor, or VCR without internal installation; combines Mac images with other NTSC video sources for video production.* ***Cons:*** *Camera requires setup and physical alignment to Mac's screen.* ***List price:*** *MacVideoCam $588, MacVideoCam with genlock $748, Sync Master $288, Showmaster Effects Creator $788.*



Until recently, Macintosh videophiles (not to mention video professionals) had no way to convert the Mac's high-resolution picture onto an NTSC (National Television Standards Committee) American Standard TV monitor or videotape. Nor could they combine all or a portion of a Mac image with an image from a second source and then superimpose or mix the two on videotape. Now electronics wizard Steve Baker has evolved the Desktop Video System. This system from Comtrex lets you convert and merge the Mac's images with video.



Desktop Video System

MacVideoCam is a 600-line (horizontal-resolution) desktop camera that sits on its own tiny tripod and aims directly at the Mac's screen. Since the scan rates of the Mac and NTSC monitors differ, the Mac's scan rate must be converted or a line appears across the picture. MacVideoCam converts the Mac scan rate into an NTSC video image, which can be fed into any standard TV monitor or video equipment. The system permits direct videocassette recording on any VCR, including ¾-inch VHS, Beta, or 8mm. Even a standard TV can be used for display via an RF converter output, readily obtainable at Radio Shack.

A word of caution: the limit of a TV or monitor's horizontal resolution, measured in *lines* (not to be confused with the scan rate of 525 lines at which all NTSC equipment operates), determines the degree to which the Mac's clear, sharp images can be faithfully reproduced. The more horizontal lines, or dots, the greater the clarity and crispness of the video picture. The Mac delivers a high-resolution picture of more than 500 horizontal lines. MacVideoCam records at 600 lines, more than adequate to reproduce Macintosh images. Many of the high-quality color TV monitors available show upward of 400 lines and provide an image acceptably close to the Mac's picture. However, most standard TV sets reproduce no more than 300 lines, while consumer videocassettes are even worse at about 250 lines—less than half the Mac's resolution. Therefore, small type fonts, tiny images, or thin lines may blur or become indistinguishable when viewed on low-resolution TVs or when transferred onto consumer-format videocassettes.

The real breakthrough offered by Desktop Video System is the combination of MacVideoCam with two peripherals, Sync Master and Showmaster. Sync Master merges the Mac's screen image with that of any other video source, such as a live camera or a videotape. The two synchronized images can then be superimposed, mixed, or wiped using Showmaster, which has over 30 patterns and special effects and allows the Mac to become a full-fledged character generator for titling.

Connect Tab B to Slot 3

Users can assemble the Desktop Video System right out of the box; neither internal installation nor software is required. The three components are plug-in, turn-on peripherals that are well designed and easy to operate. Although some users may initially object to setting up and adjusting the MacVideoCam's focus and exposure, even users with minimal video skills should be able to master the camera and its accessories with a little practice.

Video professionals who require synchronization to an existing video production switching system will be impressed by the fact that MacVideoCam is offered with a genlock option, which locks multiple video sources to a master-generated scan rate. Comtrex plans soon to offer a colorization option that will allow Mac-generated lettering to appear in different colors when keyed over a second video picture.

Macintosh graphics, lettering, or titles placed over home-video images of Aunt Beatrice's famous poolside snake dance are unlikely to make prime time, but ardent videophiles and home-video producers will appreciate the possibilities. The Desktop Video System, combined with software packages such as *Videoworks,* slides, or videotape, offers inexpensive, Mac-inspired productions. The Comtrex system meets RS-170A broadcast specifications for picture output and performance and looks good enough for just about any professional application.—*Richard Halmy*

See *Where to Buy* for product details.

SCSI Ports for the 512K Mac

Data Port, FastPort, MacPort+ SCSI port adapters. ***Pros:*** *Provide an inexpensive alternative for adding SCSI compatibility to 512K Macs.* ***Cons:*** *Data Port and MacPort+ may require additional cables for some SCSI devices; installation may cost extra for FastPort and MacPort+.* ***List price:*** *Data Port $299, FastPort $149, MacPort+ $189.* ***Requires:*** *512K.*



Have you been thinking about upgrading to a Mac Plus so that you can use SCSI devices such as the fast SCSI hard disks and tape backup systems? Think twice: you can get that SCSI capability for less money. For a Macintosh 512K Enhanced or a 512K Mac upgraded with 128K ROM, an adapter like the Data Port, FastPort, or MacPort+ can provide a SCSI port that works just like the one on a Mac Plus. All three are cheaper than Apple's Mac Plus upgrade because they provide only a SCSI port, rather than the increased memory capacity (separate memory upgrades are available) or the redesigned Mac Plus back panel with its round serial ports.

Each of the three adapters consists of a small circuit board that attaches to the Mac's logic board and a SCSI port that fits over the clock battery, right above the power switch. The circuit boards on FastPort (from Mirror Technology) and MacPort+ (from Peripheral Land) clip to the 68000 microprocessor, whereas the Data Port circuit board (from SuperMac Technology) plugs into the ROM sockets. If there's an advantage to either method, I couldn't determine it during the two weeks I used each adapter.

Mirror's FastPort uses a DB-25 connector for the SCSI port, just like the Mac Plus. Peripheral Land and SuperMac use a SCSI-standard 50-pin connector, like the one on most SCSI disk drives. Neither style is inherently better, but more disk drives probably come with a cable for the Mac Plus-style DB-25 connector. You may have to buy an extra $30 cable for the Peripheral Land or SuperMac adapter. However, if you buy a disk drive and adapter package from the same dealer, the dealer will probably make sure you get the right connecting cable.

Installing any of the adapters is straightforward, but if it's not done with the proper tools and techniques, you run the risk of ruining parts of the Mac. For that reason, Peripheral Land and SuperMac recommend that you have an electronics technician do the work. Mirror does include tools for opening the Mac, a soldering iron, and solder with the FastPort, but encourages those who are uneasy about installing the adapter themselves to get qualified help.

Is It Butter?

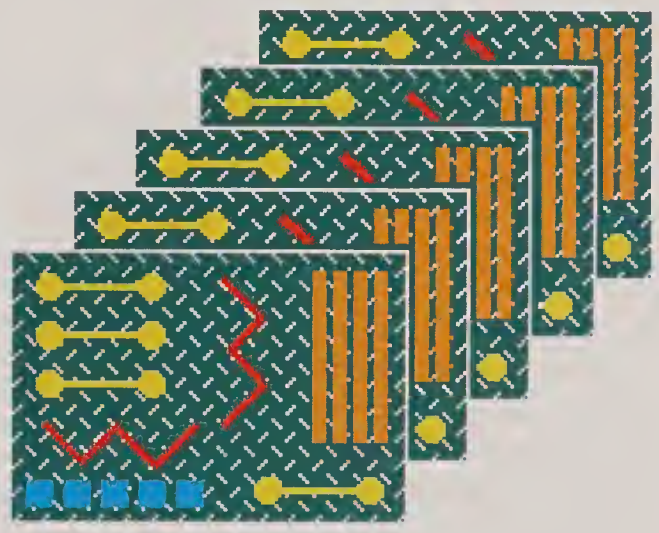
You'll find it easier to tell butter from marvelous margarine than to tell these SCSI adapters apart or to distinguish them from the SCSI port on a Mac Plus. I tried each adapter with three different 20-megabyte disk drives: Apple's Hard Disk 20SC, Peripheral Land's PL20, and SuperMac's DataFrame 20. In every case, the Mac started up from the hard disk and operated at the same speed. A stopwatch showed some split-second differences in starting *Microsoft Excel* and opening a 215K *Excel* document, but the differences were so small they could have been caused by incidental factors (such as me).

I successfully daisy-chained a couple of disk drives and a tape backup system to each adapter. Here again, the results were the same as with a Mac Plus. I expected and found trouble when more than three SCSI devices were connected, apparently caused by a Macintosh memory-management problem (see *Quick Tips,* in this issue). Not surprisingly, tape backups and other extensive file- or disk-copying operations take longer on a 512K Mac than on a 1024K Mac Plus.

Run, Don't Walk

If you've considered upgrading your 512K Mac to a Mac Plus so that you could attach a SCSI hard disk or other SCSI device, reconsider. Mirror, Peripheral Land, and SuperMac SCSI adapters can all give your 512K Mac with 128K ROM full SCSI compatibility at a much lower price.—*Lon Poole*

See *Where to Buy* for product details.



PCB Design

McCAD PCB *3.1-8*

Printed-circuit-board layout software.
Pros: *Handles multilayered boards; pull-down menus provide a wide choice of pads, trace widths, hole sizes, and zoom.* ***Cons:*** *Layers displayed simultaneously in different shades of gray are difficult to distinguish; manual contains errors.* ***List price:*** *Version 3.1-9 $395.* ***Requires:*** *512K.* ***Copy protection:*** *Key disk.*

Designed for engineers, *McCAD PCB* is a software package for laying out printed circuit boards—one of a set of modules that almost make the Macintosh into an electronic design workstation. (Other modules in the series are Schematics for circuit capture, Metric/SMT for surface mount design, Auto-Router, and DACS for digital circuit simulation.)

Layer Selection

McCAD PCB can handle boards up to 30 by 30 inches. Six layers can be viewed at once or called up separately from the layer selection option in the Vertical menu. The layers are called Silk, Pads, Top, Inner 1, Inner 2, and Bottom. When you're looking at the screen, the Silk and Top layers appear in black and the others are in different shades of gray. It's difficult to distinguish one layer from the others, especially at the lower magnifications (low percentages of scale).

The program could be improved by changing the "see everything at once" format to a "two layers at a time" presentation. Without the obvious benefits of color in a layer-based program, the gray tones tend to look too much alike—especially at low scale levels. It would be better to use black and gray (one value) on white and deal with the layers in pairs.

The fairly complete library of layout symbols (contained in the Vertical, or icon, menu) is represented by icons on the opening screen. At the left of the screen is a double column of icons that fall into three broad groups. The first group includes the pointer, text, lines, and rectangle. The majority of the menu consists of pads, multiple lines (which are used for edge connectors), holes, DB-type connectors, and an alignment bullet (or target). Except for the symmetrical shapes, either horizontal or vertical orientation can be selected. The remaining third group provides for layer selection.

Thirteen pull-down menus allow for additional design elements. DIPs of 8 to 40 pins are available with .3-, .4-, .6-, or .9-inch spacing. Standard DB connectors (9, 15, 25, and 37 pins) and To patterns (3, 4, 6, 8, 10, and 12 pins) provide a compact but useful library. The scaling (zoom) factor ranges from 20 to 1000 percent. Eighteen pad sizes are available in round, square, oval, or rectangular shape. There are 18 line (or trace) widths, ranging from .01 to .5 inch. The 17 hole sizes are specified in inches, by drill letters, and by drill numbers. *McCAD PCB* provides for custom design of new symbols in a special template library, using the Clipboard to transfer corrections or for temporary storage of drawing elements.

The Layout menu provides for seven steps of grid spacing from .02 to .2 inch, and a ruler feature can be toggled on or off (see "Circuit Board"). This menu also sets the layers that are shown on the display. The Art menu contains the toggles for printing or plotting all (or different combinations of) layers. You can use an ImageWriter or LaserWriter for printout and a Houston Instrument DMP series, Hewlett-Packard 74XX/75XX series, or compatibles for pen plotting. Gerber format software is an option. VAMP offers in-house plot and fabrication services for people who don't have pen plotters or board production facilities.

McCAD PCB is one of a family of stand-alone products designed to cover the entire process from schematic capture to PCB layout. Use of a net list/wire list and a parts list—plus an autorouter—should certainly make the electronic design process a lot simpler than using a drafting board and sticky tape. However, the manual doesn't instruct the designer on how to use the net list, the autorouter, or the supplementary programs with *McCAD PCB*.

As a stand-alone PCB layout program, *McCAD PCB* is easy to use. As with most Mac software, the icons and pull-down menus make learning the program an almost intuitive process. This is fortunate, since the user's manual contains some incorrect instructions, the tutorial appears after the reference section, and there is no index. However, each menu is explained in detail, and an appendix shows the output device setup menus and cabling diagrams for the serial plotters.

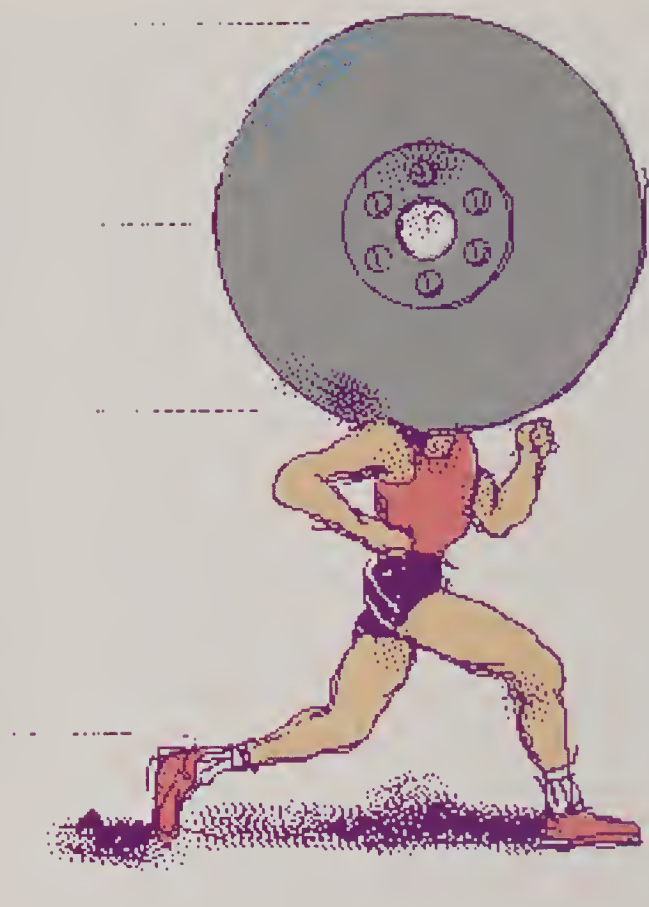
Although *McCAD PCB* does not offer the same level of sophisticated design as IBM PC programs like *Wintek,* printed-circuit design programs for the Mac will improve when they use color to distinguish the layers and symbols.—*Ken D. Schmeupe*

See *Where to Buy* for product details.

The Trash Compactor

***DiskExpress** 1.06*

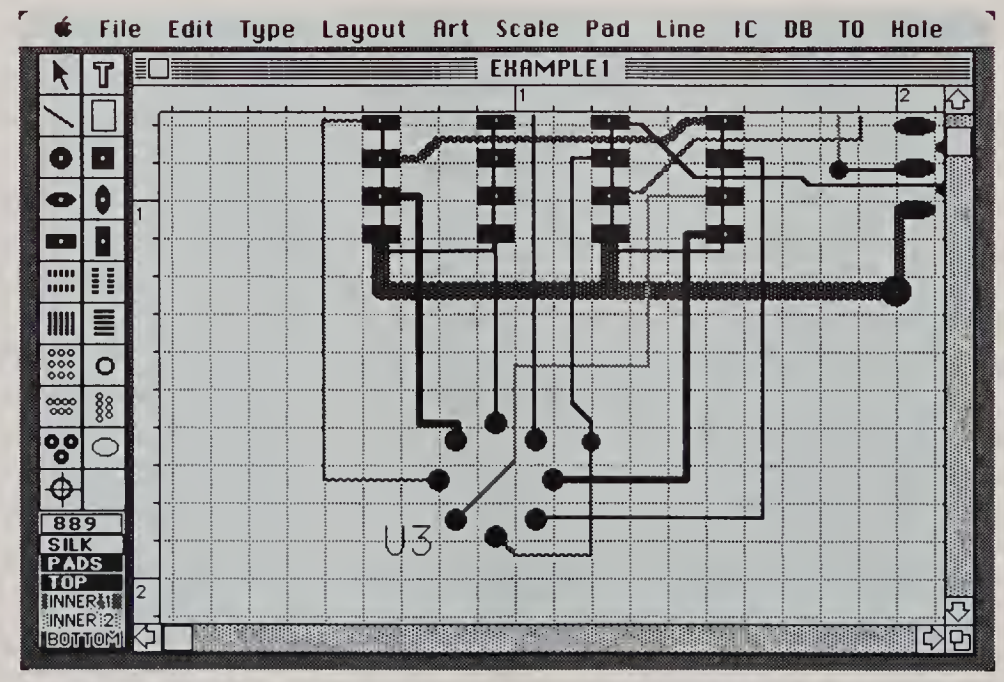
Disk manager. ***Pros:*** *An inexpensive way for hard disk users to speed up file access time and repair file directory damage.* ***Cons:*** *Not compatible with copy-protected software.* ***List price:*** *$39.95.* ***Requires:*** *512K.* ***Copy protection:*** *None.*



So you dropped a bundle on that new 20-megabyte hard disk, and digital life couldn't be better. The difference in speed and ease of access justifies the expensive hardware. As you continue to work, however, particularly on spreadsheets and databases, you notice a slight slowdown in the time needed for such basic chores as opening files, quitting applications, and booting. Your problem is fragmented files. *DiskExpress* from ALSoft can get your files back together and make you feel good about disk I/O again.

Disk drives, fixed or floppy, handle information in 512- or 1024-byte blocks, arranged on the disk in concentric rings, or *tracks,* which are further divided into pie-shaped slices called *sectors.* Because most files are larger than 1K, they are written in a series of blocks, which must be indexed in another group of blocks called the *directory.* Before the disk drive head travels across the media to read a file, it must first consult the directory to calculate how large the file is, how many blocks are used, and their locations. Any file written to disk is also mapped out in the directory.

This mapping allows the drive to write files in blocks scattered widely over a disk. Unfortunately, a disk containing files that have been changed frequently may end up having a patchwork of fragmented blocks. The time the head takes to travel between isolated blocks of data is the extra time that you sit there wondering what's taking so long.



Circuit Board
The McCAD PCB *screen shows part of a printed circuit board at 200 percent magnification. A ruler appears at the top and the left of the screen. The grid can be toggled on or off.*

Change of Address

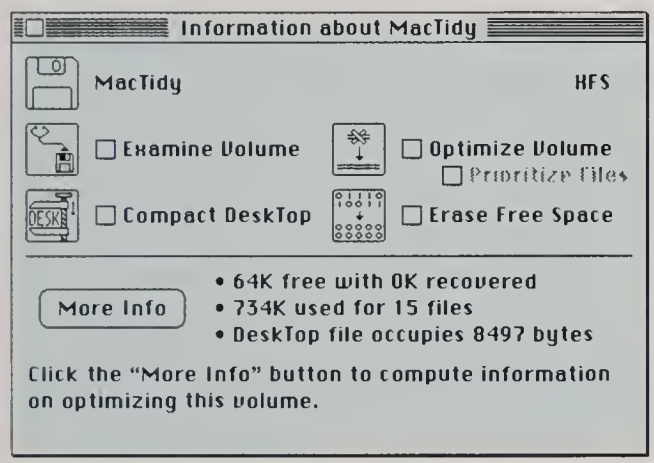
The main function of *DiskExpress* is to lift your fragmented files and rewrite them contiguously. After the program boots, a window presents you with a choice of four operations from which to select. The first option is Examine Volume, which reads through the disk to determine if there are any errors in the blocks or directory. ALSoft warns in its documentation that an attempt to rewrite damaged files

will result in the permanent loss of data. The company also warns against using *DiskExpress* on software equipped with copy-protection schemes; these may cause files to appear to be damaged. *DiskExpress* informs you of any damaged files it discovers and may be able to repair bad directory entries caused by a bug in older versions of the Finder.

Optimize Volume does the actual reorganizing. Be prepared to wait; optimizing a single-sided floppy takes less than a minute, but 3 megabytes on a hard disk can last a good 20 minutes. One option under the Optimize Volume command is Prioritize Files. This reorganizes files so that the most changeable are written last, reducing the chance that applications and read-only files will be scattered again.

Among the clutter that the Finder collects for you are all the old icons and Get Info comments from files that have been deleted. When starting up, the Finder has to sort through all of these in order to create the Desktop environment. The Compact Desktop command deletes the obsolete items without altering current ones, speeding up start-up time as well as reducing the size of the Desktop file. Finally, Erase Free Space erases data in unused blocks left over from deleted files. This is mainly a security feature that prevents anyone from recovering parts of confidential files you thought were long gone.

After selecting the functions you want, you must start them from the menu bar, an awkward but probably wise system, since you are given no warning before the process begins. Once it's going, *DiskExpress* keeps you informed of its progress with flashing icons and a time scale. Also displayed are the Desktop icon for the volume being optimized and whether it is HFS or MFS.



Disk Express Options
The HFS disk being run here is MacTidy. You can select any or all of the options, and they will be completed in succession.

The Compatible Computer

ALSoft certifies *DiskExpress* to be compatible with the Apple Hard Disk 20, Macintosh XL, LoDown, Paradise, Corvus, Tecmar, MacBottom, AST-2000, AST-4000, DataFrame, HyperDrive, and Micah drives, as well as with Infosphere's *MacServe* multiple-volume software. Although *DiskExpress* works with floppies as well as hard disks, the decrease in file access time is a better value for the hard disk user with many frequently updated files. Floppy disk users may obtain many of the same results by a different, free procedure. Simply copy your files off and then back on again after reformatting.—*Scott Spanbauer*

See *Where to Buy* for product details.

From Points to Polygons

***Geometry** 1.0*

Geometry tutorial. ***Pros:*** *Quick and easy accessibility to pertinent information; layered response capability.* ***Cons:*** *Lacks quick access to complete answers for partial proof problems.* ***List price:*** *$99.95.* ***Requires:*** *512K.* ***Copy protection:*** *Key disk.*



The Apple II has long been considered *the* computer in the educational sector. Yet increasingly, companies like Sensei, a division of Brøderbund Software, have been developing educational software for the Macintosh. Sensei's first release is *Geometry,* a first-year tutorial package that guides the student through the basic concepts of geometry.

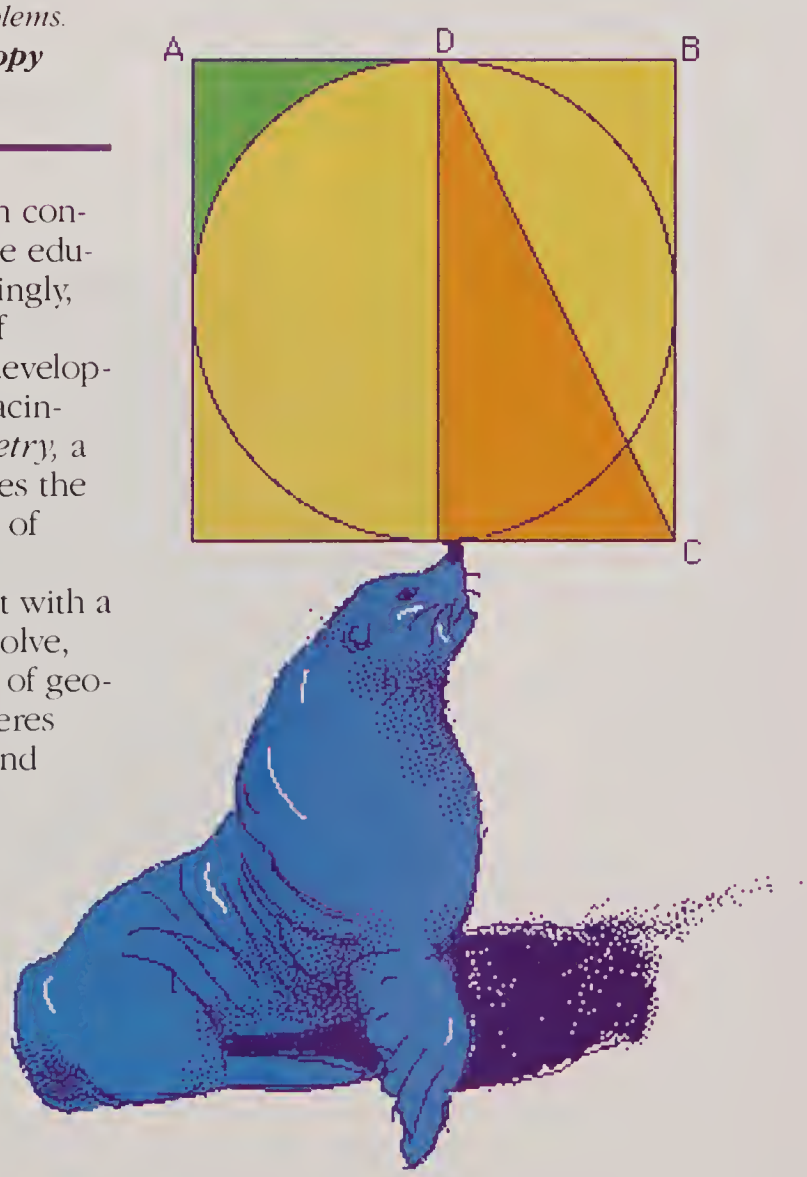
Geometry presents the student with a variety of problems and proofs to solve, accompanied by clear explanations of geometric concepts. The program adheres to the two branches of postulates and theorems, "classical" and "simplified," and lets the student choose between them in accordance with the approaches followed by standard geometry textbooks. *Geometry* uses the graphic capabilities of the Mac to animate these concepts, lending an interactive element to the learning process (see "Measurement in Motion").

The program divides the material into chapters. You can turn pages backward or forward and review concepts, postulates, or theorems by selecting them from the Table of Contents or by using the Index command. The Table of Contents, however, provides access to chapters only, not particular pages. Using the Print Page command, you can also print any page (including proofs) that's visible on the screen.

Better than a Textbook?

On the first page of the user's guide, the developers of *Geometry* state that the program was "made to complement, supplement, and reinforce textbooks." Two features distinguish this program from geometry texts: animation and the response capability.

The animation, while somewhat useful, is not what makes the computer tutorial better than textbooks. More important is the immediate response the student receives—feedback on whether an answer



is wrong or right, a hint at a particularly difficult juncture in a proof, or a quick review of some basic concept that suddenly makes everything clear.

For example, suppose you have just been introduced to the postulates of congruent triangles, and you're stuck in the midst of a congruence problem. You're sure that you could work it out if you could only remember a particular postulate, or if you only had a hint. Instead of wading through previous material or turning to the back of the book for the correct answer, you can pull down the Help menu and choose between Reference, Hint, or Solution. Reference gives you background information associated with the problem you're working on. Hint provides a clue to the given problem; and if you must have the answer, Solution gives it to you.

Writing Proofs

Geometry offers the student tutorial sections covering the major theorems, postulates, and definitions needed in the writing of any particular proof. One fault in the program, however, lies in its design of partial proof problems. *Geometry* randomly selects the statements and reasons that are missing from a particular proof problem. But when working out the problem, you can view only the statements for the proof or the reasons—not all the statements and reasons together. This exercise may be helpful in the practice of problem solving, but if you're really stuck and want to see the complete reasoning process, you're forced to jump back and forth between the statements and reasons options.

Geometry does what it claims to do—offers a first-year tutorial in the study of geometry. Its contents are sound and adhere to the academic standards of current textbooks. Its user guide is comprehensive and well written. Through its intelligent use of the computer medium and the Macintosh interface, *Geometry* provides immediate access to pertinent information and a diverse approach to problem solving.
—*Valerie Kuletz*

See *Where to Buy* for product details.

Alphabet Soup

A B sCenes I

Preschool educational game. ***Pros:*** *Simple to use; good animation.* ***Cons:*** *Depends on keyboard for input; doesn't hold child's interest.* ***List price:*** *$39.95.* ***Requires:*** *128K.* ***Copy protection:*** *Not copyable.*

Easy as ABC

Preschool educational game. ***Pros:*** *Includes a variety of entertaining games with excellent graphics.* ***Cons:*** *Emphasizes alphabetization rather than phonetics.* ***List price:*** *$49.95.* ***Requires:*** *128K.* ***Copy protection:*** *Not copyable.*



Just as "Sesame Street" turned television into an alphabet tutor for a generation of preschoolers, the right software turns your home computer into a patient instructor for developing early reading skills. Two such packages, *A B sCenes* from Compu-Teach and *Easy as ABC* from Springboard, are designed to teach alphabet skills to children under six. While neither threatens to replace "Sesame Street" or a patient parent with an ABC book, both programs show clearly the strengths and weaknesses of computers as preschool educators.

A B sCenes

In *A B sCenes,* the standard Mac menu bar is replaced by a screen-size menu that offers three different game choices. Game One is the simplest: pressing any letter key rewards the child with a picture of an object whose name starts with that letter. For example, *E* shows an egg cracking; *P* shows a pipe puffing. This is fun at first, but it loses its appeal once all the pictures have been displayed two or three times. Still, this repetition helps the child learn to recognize each picture by its given name and letter—a necessary step before going on to the second game.

Game Two reverses the procedure: the computer shows a picture and the child responds by pressing the appropriate key. Even if the child is familiar with the names and letters assigned to each picture by the program ("bag" rather than "sack," for example), a big obstacle stands in the way of success with this game: the QWERTY keyboard. A child needs considerable patience to search out letters, and many children give up in frustration before they master the keyboard's illogical arrangement.

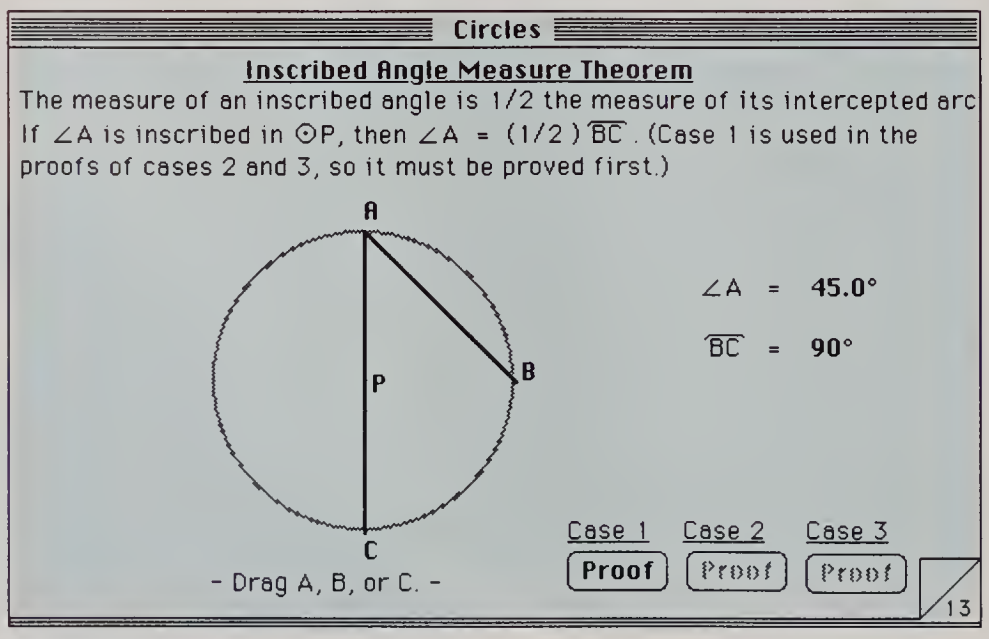
This problem is compounded in Game Three of *A B sCenes,* in which the child must type the whole name of the pictured object. There's no penalty for a mistake except a beep, but repeated beeping discourages kids who lack confidence in their abilities with the alphabet or the Mac.

Easy as ABC

Springboard's entry in the alphabet wars is more sophisticated and more fun than *A B sCenes.* The opening screen of *Easy as ABC* is an inviting picture menu that offers five game choices. (The games, along with sound control and screen printing options, can be accessed via the menu bar or ⌘-key shortcuts.)

Match Letters is an easy game for the youngest students. The screen shows a word at the top and a set of scrambled letters at the bottom. The child drags the letters from the bottom to the top in any order, placing each letter under its match.

Measurement in Motion
The Mac's graphics capabilities lend themselves to Geometry's *animated teaching techniques. Here, a lesson illustrates the Inscribed Angle Measure Theorem.*





When the word is complete, it turns into a picture of a familiar object or animal.

Honey Hunt is another letter-matching game. In this one the child must guide a bee to the flower in which the uppercase letter and lowercase letter match (for example, *Q* and *q*). By finding the correct flowers, the child helps the bee to fill its hive with honey. As with the other games in this package, there are no penalties for wrong answers.

Dot to Dot displays a sequence of letters in a field of dots. By clicking on the letters in alphabetical order, the child outlines a picture that fleshes out when finished. After a few rounds, the sequences start with letters other than *A*. Several levels of hints appear automatically in response to inappropriate choices.

Leapfrog is another game for teaching alphabetical order. In this game, the screen displays a sequence in which one letter is missing (for example, H_J). Clicking on the appropriate letter displayed elsewhere on the screen causes a frog to jump up and fill in the missing letter.

Lunar Letters is the final letter-sequencing game. The player must determine which letter in the group shown at the bottom of the screen comes first alphabetically and then drag that letter to somewhere else on the screen. This process is repeated until all the letters are scattered about the screen, and a spaceship then traces the alphabetical path that the letters form on the screen. This one is the most confusing of the five games; beginners find the rules unclear, and when you drag the letters, you don't hold down the mouse button as you'd expect. After clicking on the correct letter, you can use the mouse to move the letter around the screen.

The Lesson

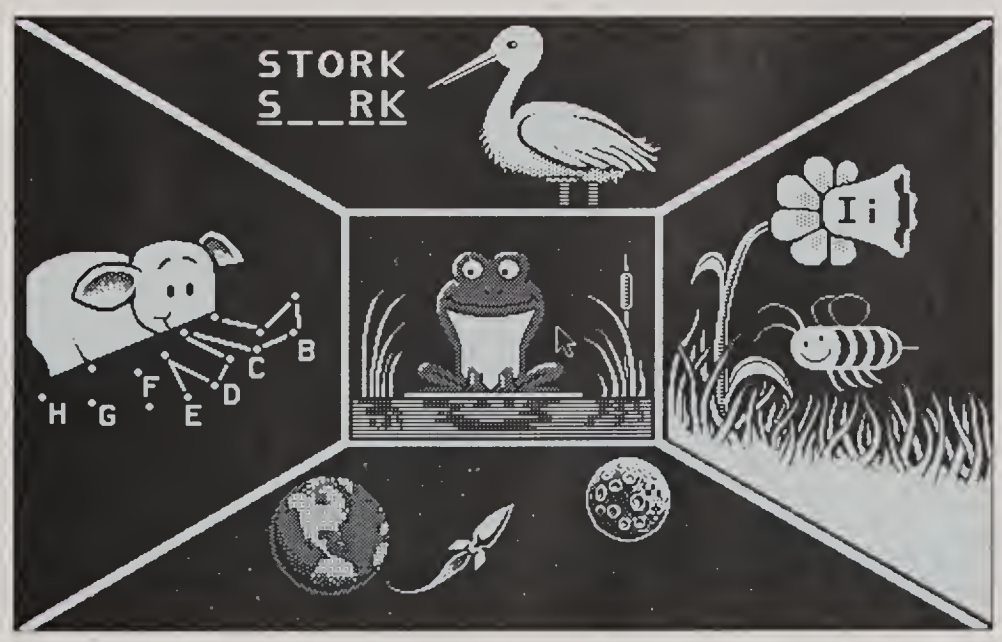
Easy as ABC is clearly a better value than *A B sCenes*. By using the mouse rather than the keyboard for input and by giving lots of hints along the way, the package provides a friendlier learning environment for youngsters. But how good is it, really?

The *Easy as ABC* manual states that it "was created to be the ultimate alphabet skills game." If that was the goal, the designers have more work to do. Some key features are missing, the most important being speech. Several current educational programs (*KidsTime* by Great Wave Software and *Speller Bee* by First Byte, for example) talk to kids, naming objects and concepts the same way a teacher would. For an alphabet game to teach more than shape-recognition and alphabetical order, it should have built-in speech capability.

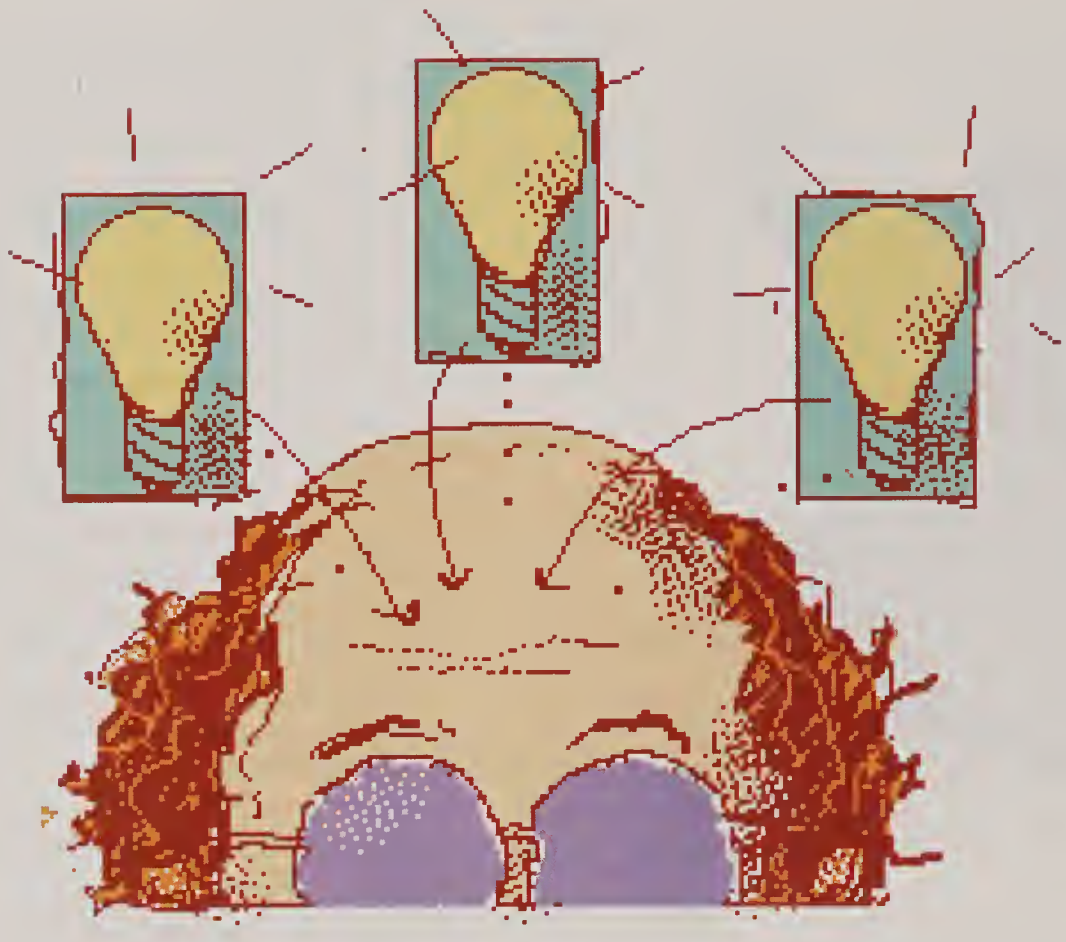
The manual also claims "*Easy as ABC* was originally designed to enable young children to play on the computer without adult supervision." Maybe so, but a child who doesn't know the alphabet won't get far without some initial help from mom or dad on most of these games.

Both of these programs use graphics effectively, and either one helps youngsters learn their ABCs—*A B sCenes* by teaching what letters words start with and *Easy as ABC* by teaching alphabetical order. Together the two give a complete alphabet lesson but without speech or phonetics. If you've been waiting for the ultimate alphabet skills game, your wait isn't over yet.
–George Beekman

See *Where to Buy* for product details.



Pick a Game
Easy as ABC *has a friendly picture menu that makes it easy for children to select one of the five games included in the program.*



A Muse for the Mac

Calliope *1.3*

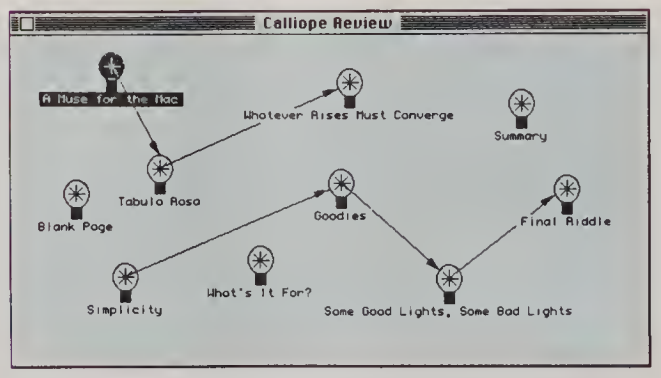
Idea processor. ***Pros:*** *Simple, free-form idea processing; compatible with Switcher and word processors.* ***Cons:*** *Needs backward scrolling and editing abilities in previewed text.* ***List price:*** *Version 1.4 $59.95.* ***Requires:*** *512K.* ***Copy protection:*** *None.*

When is an outliner not an outliner? When it's a muse. Named after one of the nine muses of Greek mythology, *Calliope,* by Innovision, is a freewheeling program that has been used by writers, executives, advertisers, and teachers to track new ideas. Although it will be compared with outliners like *ThinkTank, More, MaxThink,* and *Voila,* it's really in a different league. If you're assembling a mass of facts and notes, an outliner might help. But if you're brainstorming and need to toss a net, then *Calliope* can catch those ideas.

Tabula Rasa

Calliope is extremely simple to use. Double-clicking on a blank page generates a light-bulb icon that you can name. Hit Return and a new screen appears where you can enter text as in a word processor. Hit Return again and you've entered your idea. Highlighting one light bulb and then Shift-clicking on another links them with an arrow, and you can daisy-chain ideas by repeating the process (see "The Calliope Desktop"). You can drag the light bulbs anywhere on the screen to create structures to help you visualize your ideas, and you can unlink any group, or the whole desktop, and relink them differently.

While not an outliner, *Calliope* can imitate a topical outliner because of its ability to link ideas to a common concept. Most outliners, however, follow a rigid structural hierarchy from the main topic down through the subtopics. With *Calliope,* by contrast, your logical priorities can change in a flash: you can create a separate top-down chain, or you can build several bottom-up branches or independent clusters.



The Calliope Desktop

The application was employed by the authors to write the review. Notice that the lower path beginning with "Simplicity" was not printed, and that some of the options were not linked in the printed path beginning with "A Muse for the Mac."

Whatever Rises Must Converge

With *Calliope* you can draw only one arrow from an idea, although you can have many arrows to that idea, each on a different path. Hence, you can have headings and text for several letters, or several plots for a novel, all leading to the same ending. What you can't have is a traditional genealogical chart or a conditional branch, since both require several arrows from your idea. Instead, you have to construct a bottom-up genealogical tree toward light bulbs called Marriage, to which all children, wives, and husbands would ultimately converge. IF . . . THEN conditional statements would have to be manually constructed by unlinking a branch and then redirecting that arrow to another branch. And in the manual's example of a hierarchical organizational chart, the last becomes first and the first, last: on screen, the president is at the top with arrows flowing upward from the employees, but when the screen is printed, the president winds up at the end of the list.

Calliope provides a Help menu that activates automatically when you make a mistake. Additionally, you can use the Clipboard or Switcher, or save your file as "text," moving ideas between *Calliope* and a word processor or page layout program. The Options menu allows several choices: you can use a grid to help line up icons, select one idea per page for printouts, and print boldface idea labels to serve as headers with your text. To print a clustered idea, you just select the first bulb that you want in the chain, and all subsequent ideas will print, either on paper or on screen. (A closed circle of linked ideas will be printed only once.) If you preview the text on screen, however, you can only scroll forward through the linked text—a serious flaw. Nor can you edit the text.

And so—rephrasing our original riddle—when is a muse not a muse? When it's an outliner. Use *Calliope* to discover what you think, not to structure what you already know.—*Rusel DeMaria and Michael Miley*

See *Where to Buy* for product details.

INTRODUCING

RAGTIME

Integrated Page Processing

Highlight areas with eight levels of screens, including white print on black background

Easily import and size graphics within any document

Draw lines for accent

Mix type fonts, styles and sizes within any format

Copy automatically flows from column to column or page to page

Generate forms for usage as often as needed

Powerful spreadsheet for independent usage or use within other documents

Create frames of various shapes, sizes and border thicknesses

THE RAGTIME REVIEW

We've taken the four most wanted page processing applications and integrated them into a single, simple, easy to use package - **Ragtime**. Because they are integrated, you never have to leave the program to build your document. All the software modules are right at your fingertips.



Whether you're a secretary just starting to learn word processing, or a top-flite graphic designer, **Ragtime** delivers a complete set of tools that allow any user to create documents which will impress even the most critical of publishers.

You could be the college student preparing a thesis. Or, you might be a businessman developing a crucial proposal complete with spreadsheet, text, and graphic presentations. Perhaps you own a self-service typography, layout, and graphic design studio. Could you be an executive secretary who has typical word-processing needs, but would like to grow to real page processing? Whatever your need, large or small, **Ragtime** is the solution.

From memos to magazines, **Ragtime**'s Word Processor is the complete answer for creation of text. As a stand-alone word processor, users can begin with a familiar item like a letter, and quickly grow to complex documents.

Building multiple pages at a time with headlines, multiple columns, variable margins and with optional justification is what we mean by Page Layout, known formally as Desktop Publishing. **Ragtime** easily integrates your word processing text into formatted pages. Without limits, you can grow into a highly sophisticated set of tools for the professional graphic designer.

Since **Ragtime** is fully integrated, it is a simple process to create a form or master, save it for repeated use, or change it at will. You can quickly create any format of any length with ease.

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	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	FY86
USA	5000	4250	5275	6500	21025
AUSTRALIA	240	220	265	300	1025
CANADA	350	335	425	500	1610
ENGLAND	120	100	145	160	525
OTHER	75	75	75	75	300
TOTAL	5785	4980	6185	7535	24485

NOTICE

Ragtime may be previewed at the following trade shows:

Seybold DTP Conference	9/3/86	San Francisco
COMDEX	11/10/86	Las Vegas
MacWorld Expo	1/8/87	San Francisco
Computer Pub Expo	3/26/87	Chicago

Finally... professional results from an easy to use, fully integrated package! **Ragtime** delivers on the promise of personal computing with a complete set of powerful tools for **Desktop Publishing, Forms Generation, Word Processing,** and **Spreadsheet,** all from one package. And, we have remained faithful to the concept of the Macintosh, so that you are truly productive quickly and painlessly.

If **Desktop Publishing** is your application, **Ragtime** delivers like no other software. With **Ragtime,** you will be creating professional materials immediately. And although you have sophisticated tools at your fingertips, no publishing or graphic arts background is required.

Powerful **Word Processing** is included as a natural element of **Ragtime.** This not only eliminates the need for a separate piece of software, but means that you need not re-edit your copy as you try to make it fit into your format. And, the word processor is so complete and capable that it will quickly become your standard.

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Quick Tips

Answers to your questions

by Lon Poole

Have you seen the ads that claim you can connect seven or eight SCSI disk drives, tape backup systems, and other hardware to your Mac Plus? Theoretically you can connect seven devices (the Mac itself is the eighth SCSI device), but in reality you can expect bad craziness if you connect four or five SCSI devices to one Mac Plus. Each device has separate controlling software, called a *device driver,* that must be kept in the area of the Mac's memory known as the *system heap.* But Joel Resier of Millenium Computer in Rochester, New York, has discovered that the Mac apparently allocates only enough memory there for three or four device drivers. Attach enough SCSI devices and the system heap overflows, resulting in ugly, scaled-font menus, system errors, or other antisocial behavior.

You can enlarge the system heap with a disk editor program like *Fedit Plus* (from MacMaster Systems, 939 E. El Camino Real #122, Sunnyvale, CA 94087). Use the Edit Boot Blocks command in *Fedit*'s File menu to enlarge the system heap by 10K for each additional SCSI device. You must also change the boot blocks version number to 20 or higher so that your changes override the values in ROM. The next time you start up with the modified disk, the Mac will use the larger system heap. If you're using a disk editor that has no Edit Boot Blocks command, you'll find the system heap size for 512K and larger Macs in bytes 134 to 137 (86 to 89 hexadecimal) of sector 0 and the boot blocks version number in byte 6 of sector 0.

In December I suggested a rather awkward method for printing screen images (screen dumps) on a LaserWriter. While browsing through a northern California bulletin board recently, I found a replacement for the standard ⌘-Shift-4 function key that prints the screen directly to the LaserWriter—a $15 shareware program by Lew Rollins called *LaserKey Installer.* One caution: it doesn't work with the ImageWriter, so install it on a system disk devoted to the LaserWriter. *LaserKey Installer* is distributed by Human-Systems Interface Group, Inc., P.O. Box 1210, Vashon, WA 98070; it's also available on CompuServe and Delphi. For an explanation of function keys, see "Mac Desktop Tools," *Macworld,* January 1987.

Q Sad Mac Plus

In April 1986, you showed how to interpret the Sad Mac codes. Does that information also apply to the Mac Plus?

Robert L. Lones
Cambridge, Massachusetts

A It's taken a while to find the answer to this question. Everyone I talked to at Apple disavowed knowledge of Sad Mac codes for the Mac Plus. Then I ran across Sam Barkley, a Mac consultant in Pasadena, Maryland. He provided the information in "Sad Mac Plus Codes," which he stressed is undocumented (by Apple) and unverified but seems to be correct.

When the first two digits of the number below the Sad Mac icon are 02, 03, 04, or 05, the Mac has failed a diagnostic test of its RAM. The last four digits indicate which of the four memory modules (SIMMs) may contain bad RAM. If the last two digits are nonzero, SIMMs 1 and 3 may be bad; if the middle two digits are nonzero, SIMMs 2 and 4 may be bad. To find the bad SIMM, exchange each suspect SIMM in turn with a good SIMM. When the Sad Mac code changes, the SIMM you just replaced is bad.

Code	Meaning
01*xxxx*	ROM test
02*xxxx*[1]	RAM test–bus subtest
03*xxxx*[1]	RAM test–byte write test
04*xxxx*[1]	RAM test–mod3 (pattern) test
05*xxxx*[1]	RAM test–address uniqueness test
0F0001	Bus error
0F0002	Address error
0F0003	Illegal instruction
0F0004	Zero divide
0F0005	Check trap–CHK instruction
0F0006	Overflow trap–TRAPV instruction
0F0007	Privilege violation
0F0008	Trace trap
0F0009	Trap dispatcher error
0F000A	Line 1111 trap
0F000B	Other trap
0F000C	Unimplemented trap executed
0F000D	Interrupt button on programmers switch
0F0064	Bad System file[2]
0F0065	Bad Finder[2]

[1] When the first two digits are 02, 03, 04, or 05, the last four digits help identify the suspect bad RAM.
[2] Macs with the 64K ROM fail with codes 0F0064 and 0F0065 if the System and Finder (or other start-up application) are missing, but the 128K ROM recognizes the problem and ejects the disk instead.

Sad Mac Plus Codes

When you turn on a Mac Plus, it undergoes a series of system and memory tests (unless you hold down the mouse button before the first beep). If the Mac Plus fails any test, the Sad Mac icon shows up. The six-digit number below the icon is the key to Sad Mac's unhappiness. When the first two digits are between 02 and 05, the next four digits indicate which memory modules in RAM have not passed inspection.

(continues)

Q Distinguished Icons

How can I edit icons to show the difference between *MacWrite* 2.2 and *MacWrite* 4.5 documents?

Steven M. Deyo
Saint Paul, Minnesota

A Using a program like Apple's resource editor, *ResEdit,* you could make unique icons for each version of *MacWrite.* Then using a disk editor like *Fedit,* you would have to change the formatted-document file type for one of the two versions by changing every occurrence of the four-letter combination *WORD* in it to four other letters. For example, you could change *WORD* to *MWNU* throughout *MacWrite* 4.5. Finally, you would have to change the file type of every existing document created by that version of *MacWrite* to your new four-letter file type. You could perform that last task with *ResEdit* or any of dozens of file utility programs and desk accessories.

When you had finished that lengthy process, you'd have gained unique icons but lost the ability to read *MacWrite* 2.2 documents in *MacWrite* 4.5. Why not distinguish the versions by placing some special character in the document names of one version but not the other?

Q Desk Accessory Excess

As more and more utilities and other programs are being written in the form of desk accessories, it doesn't take long to use up the 15 available slots in the Apple menu. I know there is a way to install more desk accessories than that, but I can't find it.

Barry J. Rosenbaum, M.D.
Decatur, Georgia

A It's true that the Font/DA Mover doesn't let you install more than 15 desk accessories in the System file, which is their normal home. However, it will let you install another 15 desk accessories in an application program file, for a total of 30. Every application has its own set of desk accessories, and the desk accessories in a particular application file only appear in the Apple menu when you are using that application. For instance, an accessory you install in *MacPaint* will not be available when you use *MacWrite* unless you install it in both places. To install desk accessories in an application with the Font/DA Mover, hold down the Option key while you click the Open button in the main window. This procedure allows you to open any file, not just the System file or desk accessory files. Open an application and copy desk accessories into it as if it were the System file.

As you know, there's no such thing as a free lunch. You pay two prices for putting desk accessories in applications. First, every desk accessory you install takes up disk space. Desk accessories typically require 3K to 10K each; some are smaller, and a few are huge—30K to 50K. Disk space probably won't be a problem if you have a hard disk, but doubling the number of desk accessories may limit what you can do on a floppy disk.

Worse than the disk space problem, a desk accessory you install in an applica-

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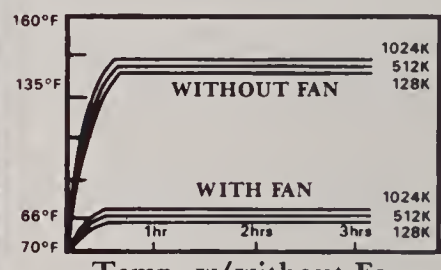
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tion program may conflict with a desk accessory in the System file. The Mac keeps track of desk accessories by number, not by name, and it expects every installed desk accessory to have a unique number. But the Font/DA Mover uses the same 15 numbers for desk accessories in an application file and in the System file. If you open a desk accessory that has the same number as one already open, nothing may happen because the Mac thinks the desk accessory you're trying to open is already open. However, the system may hang or crash and could destroy the system disk—too bad if it's a hard disk! This is the voice of experience speaking.

What to do? You could avoid opening more than one desk accessory at a time. You could keep track of which desk accessories are installed in the System file and never open them when an application accessory is open. Or you could forget about installing desk accessories in applications and get Lofty Becker's desk accessory *Other,* version 2.01 or later, or get his function-key equivalent, *DA Key* version 2.00 or later (both are shareware available from the usual on-line sources or from the author at 41 Whitney St., Hartford, CT 06105; send a blank disk, a mailer, and $5 per copy). Both allow you to use desk accessories that haven't been installed.

If you want to roll up your sleeves, you can install up to five more desk accessories with numbers different from the 15 numbers the Font/DA Mover uses. According to *Inside Macintosh,* the desk accessories may be numbered from 12 to 31; these numbers are called *ID numbers.* ID numbers 12 through 26 are for System file desk accessories and are the numbers the Font/DA Mover uses. ID numbers 27 through 31 are set aside for application-file desk accessories. So you can install a different set of five desk accessories in each application and never have to worry about them conflicting with the 15 desk accessories in the System file. To make use of those extra five ID numbers, you must use *ResEdit* (version 1.0 or later, available from user groups or as part of *Macintosh Developer's Utilities* 1.0 from the Apple Programmer's and Developer's Association, 290 S.W. 43rd St., Renton WA 98055, 206/251-6548) to renumber and install desk accessories and their resources. For each application perform the following steps.

1. Make sure each desk accessory you want to install exists in a desk accessory file all by itself. If necessary, use the Font/DA Mover to copy each one into a new file.

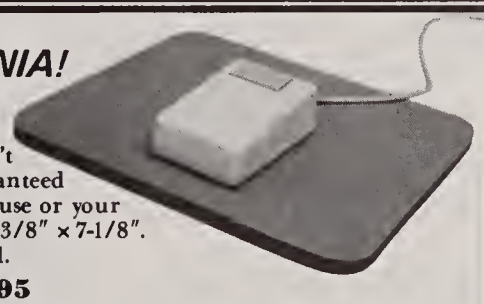
2. Start *ResEdit* and open the application where you want to install a desk accessory. The application file window appears, listing the resources in the application. Look for DRVR in the list. If you find it, there are already desk accessories in the application. In that case, double-click DRVR to see which ones. In the window that opens, you'll see one line for each installed desk accessory; each line states the desk accessory's name and current ID number. If there are already five desk accessories listed, you can't install another until you remove one using the Font/DA Mover. If there are fewer than five listed, note their ID numbers, since you can't reuse the same numbers.

(continues)

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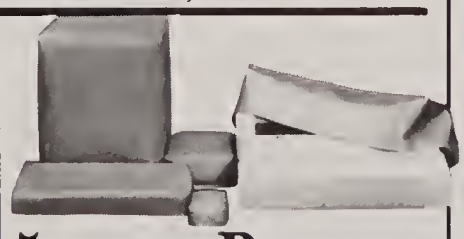


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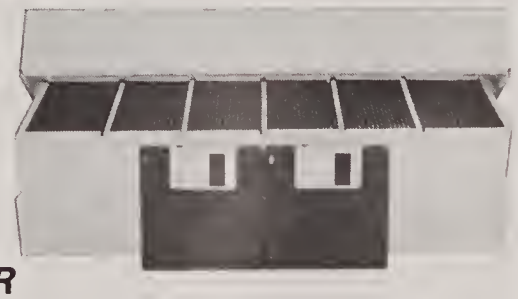


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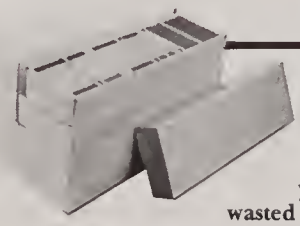


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3. In the *ResEdit* disk window, open a desk accessory file that contains a desk accessory you want to install. The desk accessory file window appears, listing the desk accessory's resources. The DRVR resource is the desk accessory itself; many desk accessories have no other resources.

4. Double-click the DRVR resource. In the window that opens, you'll see one line that states the desk accessory's name and current ID number. If you see more than one line, you didn't do step 1 correctly, or you have a weird desk accessory that these instructions won't work with.

5. Click the one line in the DRVR window and choose Get Info from the File menu. In the information window that appears, change the ID number to something between 27 and 31. Make sure you don't reuse the ID number of a desk accessory already installed. Close the information window and the DRVR window.

6. Look in the desk accessory file window to see if there are any resources listed besides the DRVR resource. If not, skip to step 8.

7. Change the Owner ID number in all the resource types listed in the window. Start by double-clicking the resource type. In the window that appears listing all the individual resources of that type, click an individual resource and choose Get Info from the File menu. In the information window that appears, change the Owner ID number to the new ID number (the one you chose in step 5). As you change the Owner ID number, the ID number changes automatically. Close the information window and repeat this step for every individual resource of the same type. Then do it again for the other resource types listed in the desk accessory file window.

8. One by one, copy the resource types listed in the desk accessory file window and then paste them into the application file window. Make sure you get them all.

9. Repeat steps 3 through 8 for each desk accessory you want to install in the same application. Quit *ResEdit* and answer Yes when *ResEdit* asks whether to save your changes.

Q Variable-Speed Modems

I plan to purchase a 1200-baud modem, but I want to make sure I can also send at 300 bps since some services charge a premium for 1200 bps. Can you suggest a good information source for novices in telecommunications?

J. Bradley Thomas
Baltimore, Maryland

A I looked at the specifications for over a dozen 1200-baud modems, and all had 300-bps capability. As long as the modem you buy can use the Hayes commands—and most can—you can select the baud rate from *Microphone, MacTerminal, Red Ryder,* and most other telecommunications programs.

For help getting started, I recommend a book or two. *MacTelecommunications,* by Jonathan Erickson and William D. Cramer (Osborne/McGraw-Hill, 1985), describes how to connect a Mac to a modem and how to use *MacTerminal* (version 1.1, no longer the latest) to connect to several information services. *Online,* by Steve Lambert (Microsoft Press, 1985), de-

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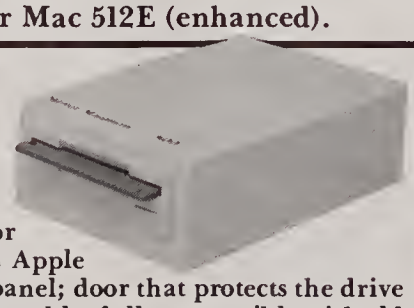
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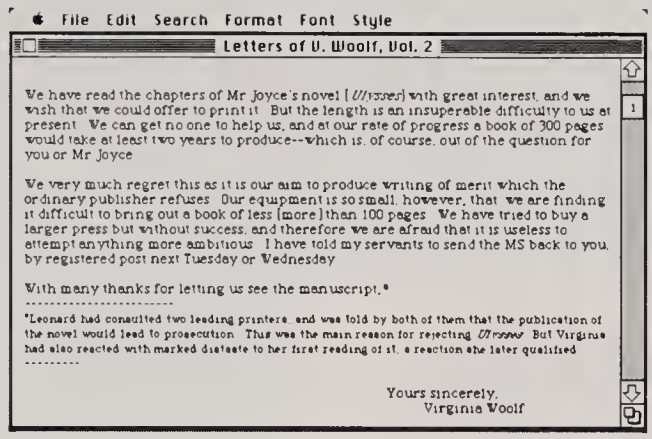
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scribes how to connect a modem to a generic personal computer (such as an IBM PC) and discusses general features of terminal programs, but doesn't specifically mention Mac connections or terminal programs. However, it includes subscriptions and free connect time to seven information services and takes you through detailed, though now somewhat outdated, sample sessions on each service.

Easy MacWrite Footnotes

Tip: In October, I mentioned that *MacWrite* doesn't provide automatic footnoting. Donald C. Thorn, of Akron, Ohio, wrote to suggest a fairly easy way to handle this deficiency. He inserts a footnote immediately after the line on which he places the reference to it (see "Nota Bene"). Then after completing all editing, rewriting, and pagination, he goes back through the document one last time and cuts-and-pastes each footnote to the bottom of the page. Because he pastes the same number of lines as he cuts, the page breaks are undisturbed. After pasting, he usually replaces the second line of hyphens with a blank line.



Nota Bene

To simplify footnotes, type them in just below the line they refer to. After your final edit and check of page breaks, cut the footnotes and paste them at the bottom of the page. This technique preserves page breaks because the switch doesn't change the number of lines on the page.

ImageWriter Control

Tip: If you want to pretty up your printouts when using MockWrite, embed hexadecimal printer command characters. They must be surrounded by the international quotation marks («» [type Option-\ and Shift-Option-\]), such as «1B 21» for bold printing. Once the command characters are in the text, then print using MockPrinter. If you don't like the bother of putting all command codes into hexadecimal, just put the escape code (1B) into hexadecimal and follow it with the text character called for in the ImageWriter manual. For example, «1B»! does the same thing as «1B 21», since the exclamation point has an ASCII code of 21.

Robert S. Morris
Washington, D.C.

This is a great way to gain control of the ImageWriter's resident fonts, a subject many of you have been writing about. MockWrite and MockTerminal are shareware desk accessories included in MockPackage *($35 from C.E. Software, 801 73rd St., Des Moines, IA 50312-1051, 515/224-1995).*

Send tips or questions to Quick Tips, Macworld, *501 Second St. #600, San Francisco, CA 94107. Send electronic mail to CompuServe 70370,702 or The Source BCW440. All published submissions become the property of* Macworld. □

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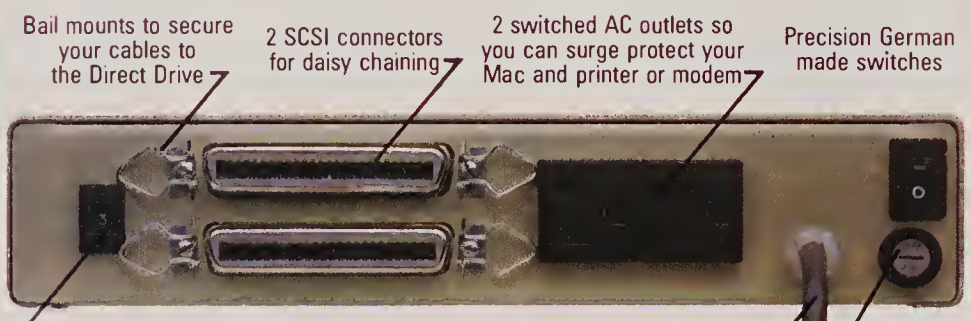
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Getting Started with Backups

Playing it safe with backups, developing a backup schedule, and other information on computerdom's necessary evil

by Jim Heid



Football players drop game-winning passes in the end zone. Last-minute Christmas shoppers lose their credit cards. A bus is missed, and with it a job interview. All of life's endeavors have worst-case scenarios—those catastrophes that fill you with a sinking feeling and a longing to turn back the clock for just one moment.

With computers, nothing can make you long for a second chance more than losing important files. Losing applications isn't necessarily a disaster; you can recopy them from master disks, provided they aren't shackled by copy protection. Losing documents, however, means recopying from printouts (if you're lucky enough to have some) or recreating them from scratch. Either way, it's déjà vu in its ugliest form.

I have no advice for clinging to credit cards or catching buses and game-winning passes, but the answer to staying afloat with computers is clearly the backup. Making "safety" copies of your files isn't fun—in drudgery's top ten, it ranks between rotating your car's tires and flossing—but it's a Mardi Gras compared to losing the only copy of a major proposal just as a prospective client knocks on the door.

Backup Plans

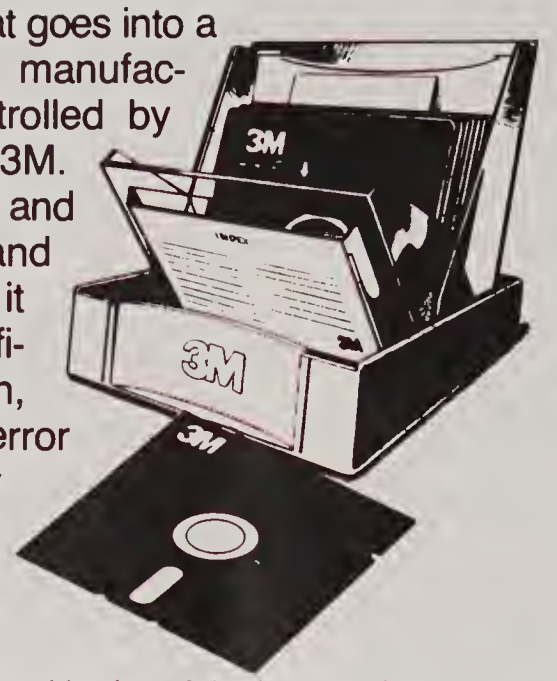
A file tucked away on a disk seems safe and sound; after all, the command reads "Save," not "Save until some unforeseen event." But the worst does happen. Disks become damaged or lost. Programs turn kamikaze, crashing and taking files with them. Power surges give hard disks amnesia. Fires start, and sprinkler systems sprinkle. Equipment is stolen. It's enough to make you want police protection, but a faithfully followed backup strategy is your only real defense.

Your backup strategy for documents depends on whether you use floppy disks or a hard disk. For applications, only one tactic applies: make copies of your applications' master disks. If a disk is not copy protected, make the backup using the Finder and the techniques described in the next section. Software manufacturers that protect their disks usually let you return a damaged master for replacement, but unless you can afford to wait for the new disk to arrive, don't take chances. Copy the disk—for backup use only—using a copying utility such as Central Point Software's *Copy II Mac*. Such programs copy a protected disk by reproducing the altered disk formats that a protected program looks for

(continues)

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before it starts. The Finder, by contrast, treats altered formats as disk errors and doesn't reproduce them on the copy.

Your System file is another candidate for copying. You can invest hours in customizing a System file with the right mix of fonts and desk accessories for your work. While you can always re-create that mix with a grueling Font/DA Mover session, making a backup of the System file is much easier. And as long as the System Folder is open, you may want to copy the Scrapbook and Notepad files, too. Unless you use a hard disk, you should be able to safely stash key System files on a single floppy labeled System Files Backup. While you're labeling the disk, jot down the list of desk accessories and fonts it contains; doing so will let you see at a glance whether the backup is still current. (See "Getting Started with the Mac System," *Macworld,* November 1986, for information on System files.)

Disk Backup Plans

Applications can be recopied and custom System files can be re-created, but documents are a different story. They're your original creations, and the floppy disks that hold them should be at the top of your backup priority list. If you have two disk drives, backing up data disks is easy. Using the Finder, initialize a blank disk or erase an old one, lock the original to avoid erasing it accidentally (slide the plastic tab so you can see through the square opening), eject the system disk, then insert the original in one drive and the backup in the other. Finally, drag the original disk's icon over that of the backup. Name and label the backup disk "Backup of [the original's name]" and write the backup date on the label.

This routine copies every file to the backup disk. As you work with the original (don't forget to unlock it first), you'll probably add to it or modify its files. You have two alternatives for keeping your backups current. You can drag only the new or modified files to the backup (clicking OK when asked if you want to replace the existing files), or you can simply recopy the entire disk. The latter takes the Mac longer but is easier for you, since you don't have to keep track of which files you've modified or added.

If you take the former route, first sort the original disk's contents according to their creation and modification dates (select the Finder's By Date command from

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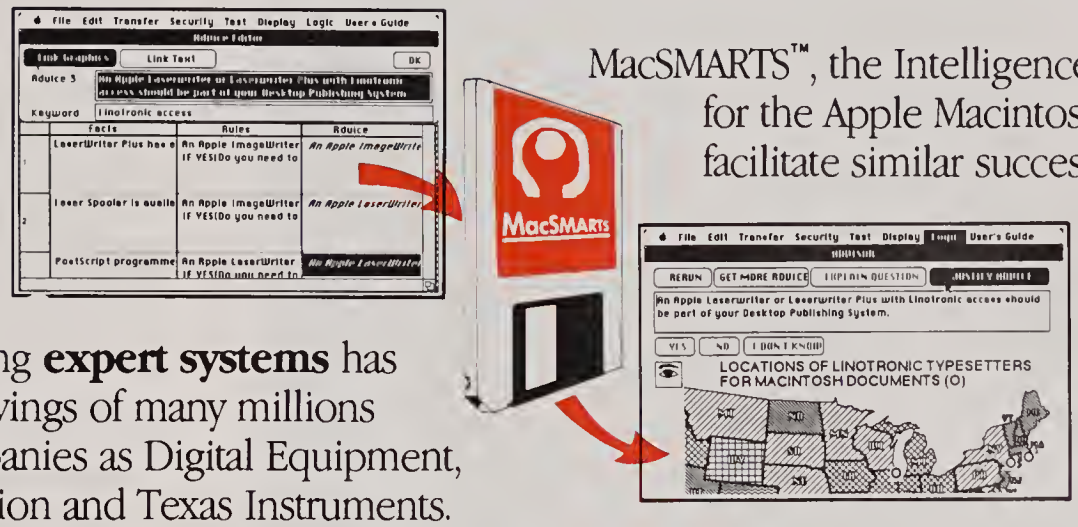
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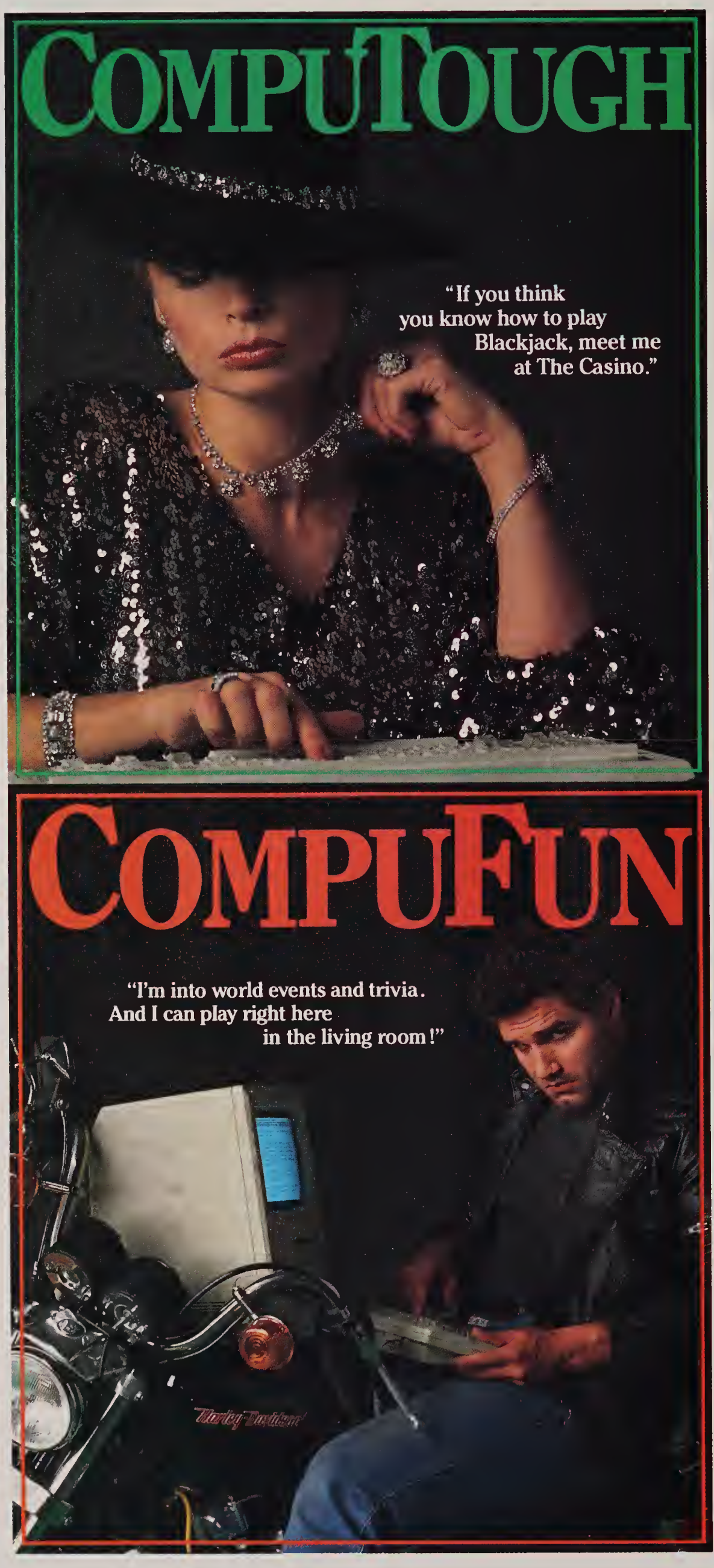
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the View menu), and then copy only those files with dates more recent than the backup date. You can also determine when a file was created and modified by selecting the file and choosing Get Info from the File menu or pressing ⌘-I.

How often should you back up a data disk? As often as necessary for your work habits and your peace of mind. If you're using a disk constantly, you may want to back it up every day. The best rule may be to back up anything you aren't prepared to re-create.

Making backups using the Finder on a one-drive Mac requires more time, patience, and wrist action. First, insert the backup disk, then eject it using the File menu's Eject command, instead of dragging its icon to the Trash. Next, insert the locked original and drag its icon over that of the backup. Unless you're copying only a few files, you'll have to swap disks during the backup process—perhaps only once or twice on a Mac Plus, but several times on a 512K.

An alternative to using the Finder for disk copying is to use a single-drive disk-copying utility such as John Mitchell's *Copier,* available through user groups and on CompuServe. Single-drive copy utilities minimize disk swaps by clearing as much memory as possible, enabling more files to fit. If you have a 128K Mac, use Apple's *Disk Copy* program, which can copy a 400K disk in four swaps.

Hard Disks Are Harder

Backing up floppies is important; backing up a hard disk is vital. If you use a computer extensively, a hard disk tends to become a magnetic representation of your life. It's all there—your business plans, personal letters, drawings, programs, whatever—and losing it all in one fell swoop is about as traumatic an experience as you can have sitting in front of a computer.

A hard disk may streamline your day-to-day computing, but it turns into a ball and chain at backup time. A hard disk can hold hundreds of files, making the job of backing up modified files a logistical nightmare. And there's a chance that some files, such as a huge database or a System file containing dozens of fonts, will be too fat to fit on a single floppy. A Mac with 400K disk drives and a hard disk is a fertile breeding ground for this kind of predicament.

Fortunately, many hard disk manufacturers come to the rescue by including

(continues)

backup utilities with their units. (A *utility* is a program that simplifies a certain computing task.) Such programs let you back up the entire hard disk, then periodically back up only new files and those that were modified since the last backup. You can also copy files back to the hard disk, a process called *restoring,* so named because the hard disk's contents are restored—along with your will to live.

Most backup utilities first tell you how many floppies are needed to back up the files you've selected, and then they begin copying files to the floppies in a special format. Instead of writing each file as a distinct entity, they group all the files together, along with information that lets the program restore the files separately. Some programs also compress data so that it takes up less space on the floppies.

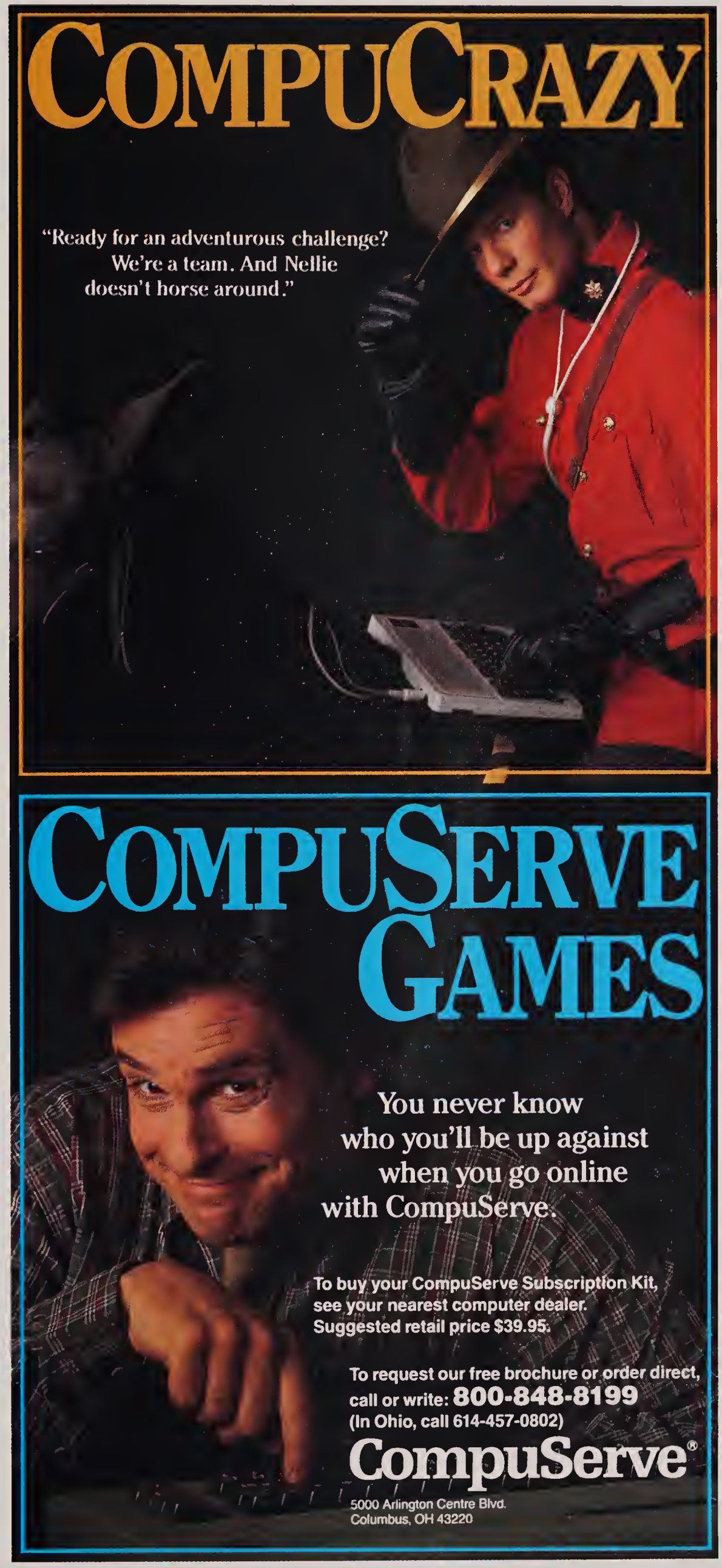
If your hard disk didn't come with a backup utility, don't despair. Several backup programs are available that work with most popular hard disks; these include *HFS Backup* from Personal Computer Peripherals Corporation (maker of the MacBottom external hard disk), *HD Backup* from PBI Software, and *FlashBack* from Mainstay (see "Taming Your Hard Disk," *Macworld,* November 1986). To be safe, before you buy the program make sure it's compatible with your hard disk. After you've backed up a hard disk and initialized it, discovering that you can't restore its contents because of some "minor" incompatibility could send you over the edge for good.

A Backup Routine

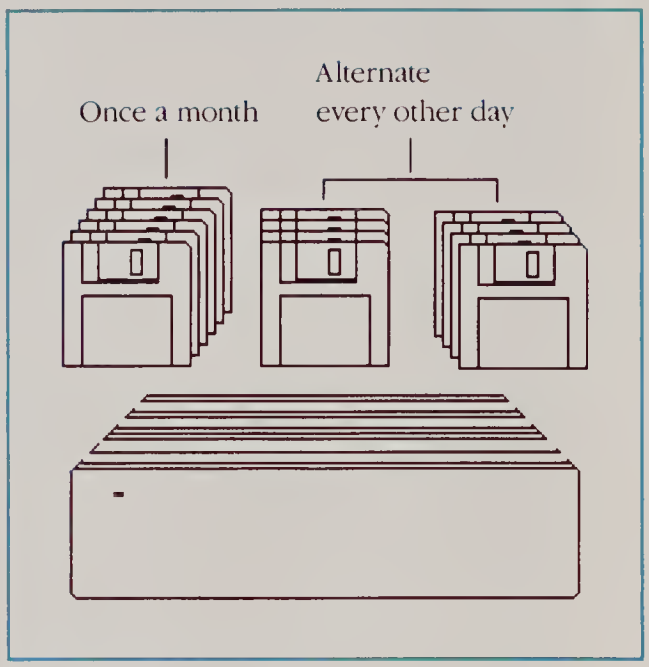
Even with a backup utility, you can have difficulty tracking what you've backed up and when, so following a strict backup schedule is in order. One routine involves backing up the disk once a month or so, then making daily or weekly backups of all files added and modified since the big backup. To restore the hard disk, first restore the files on the monthly backup disks, then restore the more recent files from the daily or weekly backups.

An even safer routine rotates three *clearly labeled* sets of backup disks (see "A Backup Rotation"). Once a month, back up the entire hard disk on the first set of disks. Every day or two, back up new and modified files, using the second set of disks one day and the third set the next. The advantage of this approach is that you end up with two sets of disks containing your modified files. If one set goes bad, you can

(continues)



Circle 330 on reader service card



A Backup Rotation
Each month, copy the entire hard disk's contents onto floppy disks. Each day, back up new or newly modified files; use two sets of disks and alternate between them.

fall back on the other, losing only a day's work instead of a month's. To restore the entire hard disk, run the restoration portion of your backup program twice: first from the monthly set of disks and then from the most recent daily set.

When to Restore

When will you need to restore the files from the backup disks to the hard disk? Some obvious answers come to mind: after losing an important file or reformatting the hard disk, which might be necessary after a power failure or program crash; after repairing a hard disk, since it was probably replaced or reformatted; if you're switching to a different hard disk or want a colleague to have a complete set of your documents.

A more subtle reason to restore is to improve the hard disk's performance. When you delete files from a disk (hard or floppy), the Mac frees their space for new files. When you save a large file or copy an application to the disk, the Mac, in its zeal to reuse the freed space, may save the file in pieces—scattered across physically separate tracks on the hard disk instead of in contiguous tracks. It takes longer for the drive's magnetic heads to leap over scattered tracks than to stroll between adjacent ones. As you continue deleting and adding files, performance begins to suffer as the drive's heads waste time thrashing around the disk searching for *fragmented* files to read or save.

To restore a hard disk so that its files are stored contiguously, first make a full backup (or two for safety), then reformat the entire hard disk. Next, restore the System files, then the applications, and finally the folders and documents. Performing the restoration process in this order ensures contiguous storing of frequently accessed System and application files.

Other Ways to Back Up

Although these utilities make hard disk backup manageable, backing up is still a tedious process that taxes your patience and wrists. If you're storing your data on 400K disks, you could have swapped forty or fifty floppies by the time you're finished with a 20-megabyte hard disk.

The alternative is the Mercedes Benz of backup devices, the tape backup—a hardware add-on that backs up hard disk files onto special data cassettes or cartridges. A tape drive backs up an entire hard disk in a matter of minutes, and you won't have to force-feed a floppy drive. Most tape backups come with programs that let you selectively back up and restore, too. Many SCSI tape backups are available (see "Shopping for SCSI Storage" *Macworld,* January 1987, and "Two Tape Backup Systems" in this issue's *Reviews*).

Priced from around $1000, tape drives are an expensive alternative to the floppy swap. They are unrivaled in the convenience department, however, and may be a necessity for offices that share a heavily burdened hard disk over a network, a working environment that almost mandates a daily backup.

Storing Backups

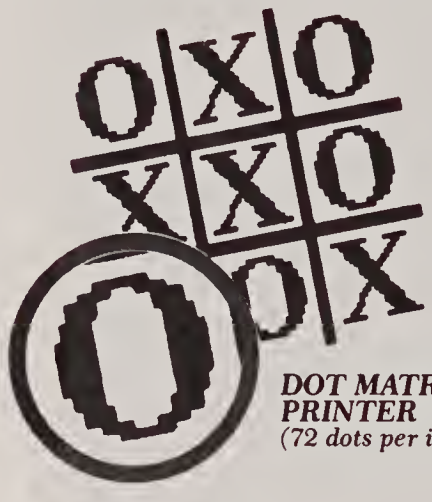
Finally, a warning that seems obvious but warrants mentioning: don't store your backup disks or tapes with your computer and disks. Fire or water won't discriminate between originals and backups, and chances are a thief won't either. Practice what the data processing industry calls *off-site storage.* Keep your backups separate—in a different room, at home, at the office, in a fireproof box, or, if you want real security, in a safe deposit box.

Is backing up really worth all the trouble? Is the Mac so unreliable as to warrant this paranoia? Not at all. In the three years I've used it, I've turned to a backup only once: on a deadline day, just hours before a huge article was due.

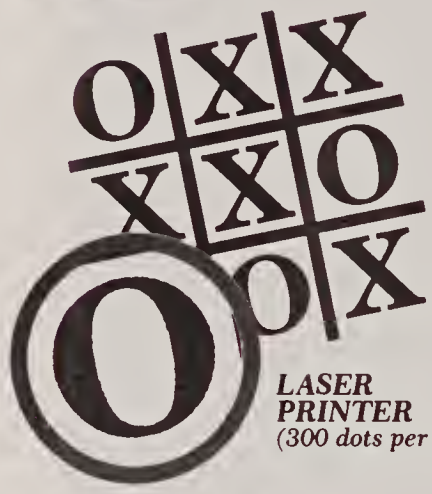
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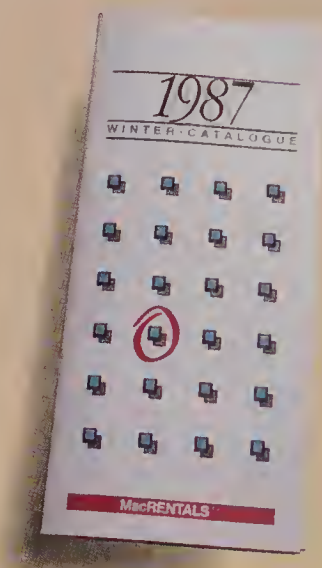
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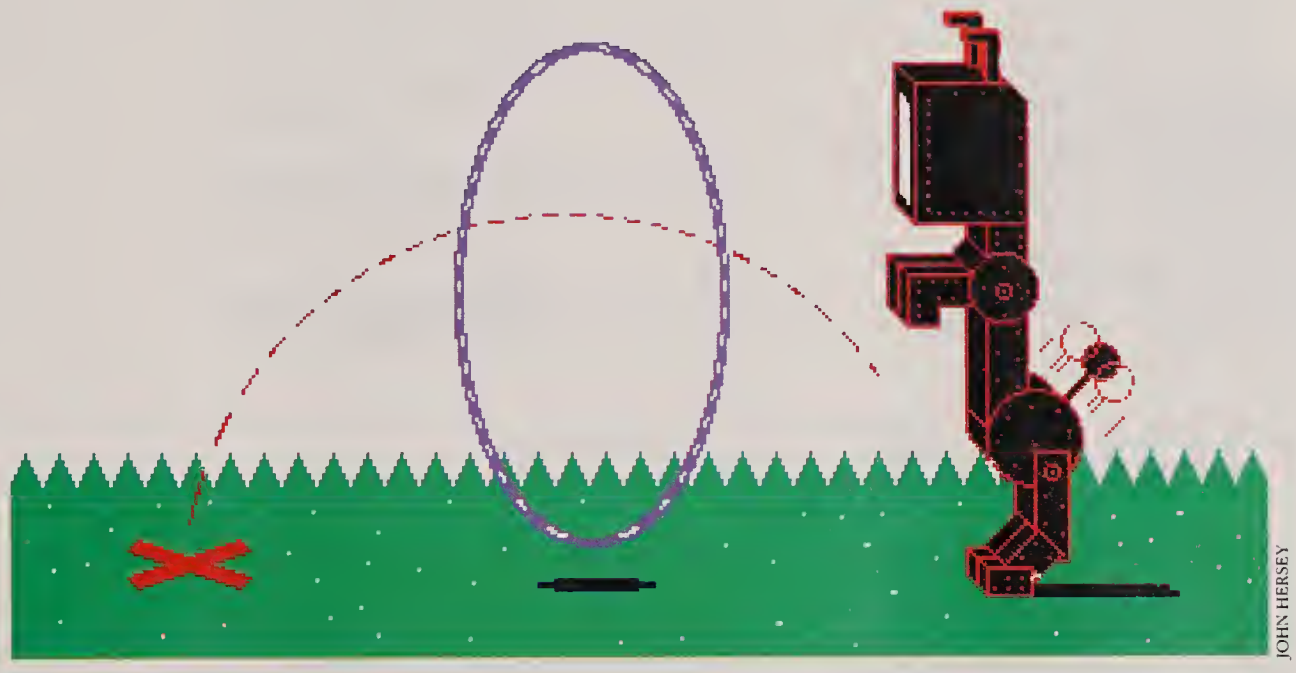
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Insights on MacPaint

Improve your MacPaint techniques 37 ways

by Erfert Nielson


JOHN HERSEY

As Macintosh products go, *MacPaint* has a long shelf life. Bill Atkinson's highly acclaimed graphics program, as old as the Mac itself, has undergone very little in the way of upgrades and has yet to become obsolete. That is not to say that *MacPaint* isn't showing its age a bit; some recently released whippersnappers–*FullPaint* and *SuperPaint*–are providing competition at last (see "MacPaint's Successors," *Macworld,* January 1987). No doubt each of those programs will find its partisans, but in the meantime, here's a collection of *MacPaint* tips for the enormous number of people who learned to rely on it while it was bundled with the Mac. Although *MacPaint* mavens will know many of these tips by heart, I hope beginners and experts alike can find a few useful techniques in the compendium that follows.

Thanks are due to Lon Poole, Apple Technical Communications, Prasad Kaipa, and several of our readers–Brad Cannon, Rob McDaniel, and Scott McKay–for their contributions.

Text Tips

Although *MacPaint* allows you to type text, word processing is not the program's forte. However, a few tricks can smooth the path.

Entering Text Mode You can mix fonts, styles, or sizes in a single block of text with the help of the Enter key. Type along until you reach the point where you want to make a stylistic change, press Enter, and then select a new font (or size, style, or any combination thereof) and continue typing. You can repeat this procedure as often as you like until you click the mouse button.

Laser Printing Text Because *MacPaint* text is recorded as a bit map, or pattern of dots, you can't take advantage of LaserWriter fonts. Whenever possible, paste *MacPaint* illustrations into *MacWrite, Word, MacDraw, PageMaker,* or other applications that can print LaserWriter fonts.

Aligning Type *MacPaint*'s Grid option can help you align corrections when you return to a line of text. Make sure the Grid is activated while you are entering text, as well as when you make corrections.

Correcting without Tears To correct an isolated word, erase the erroneous part of the word, leaving a few letters intact on one end. Then type the entire word correctly, lasso it, and align it over the remnant of the incorrect word. If you need to slide adjacent text to the left or right, surround the text with the selection rectangle (marquee) and hold down the Shift key to constrain movement to the horizontal.

Pasting with Style Text pasted from *MacWrite* into *MacPaint* via the Clipboard automatically appears in 12-point Geneva. You can change the font, style, and size of a pasted block of text by selecting the appropriate attributes in *MacPaint*'s Font, FontSize, and Style menus immediately before or after the text is pasted, as long as the text is surrounded by the marquee.

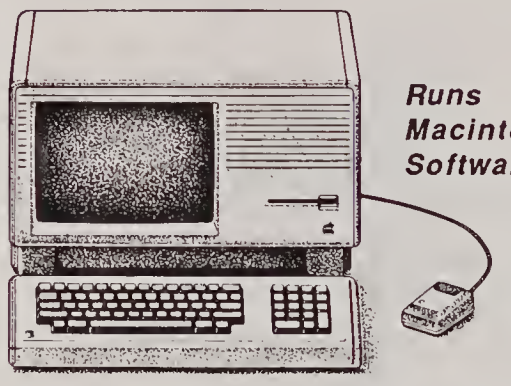
Shaping Prose When you paste text from *MacWrite* into *MacPaint,* it is surrounded by a selection rectangle. You can alter the size and shape of a block of text; words wrap around to fit into their new confines. Immediately after the text is pasted in (before clicking the mouse button or selecting any of *MacPaint*'s tools), hold down the ⌘ key and drag the lower-right corner of the dotted rectangle to reshape the text area.

Reversing Yourself You can't type white text on a black background in *MacPaint,* but there are several ways to achieve the effect of white text reversed out of a black background. Many *MacPaint* users select Outline from the Style menu, type some text, and then lasso the text and place it on a black background. This method has a flaw, however: enclosed parts of letters such as *d* and *p* remain white and must be painstakingly filled with black. A simpler method of producing white-on-black text is as follows: type some plain or bold text, surround it with the marquee, and choose Invert from the Edit menu.

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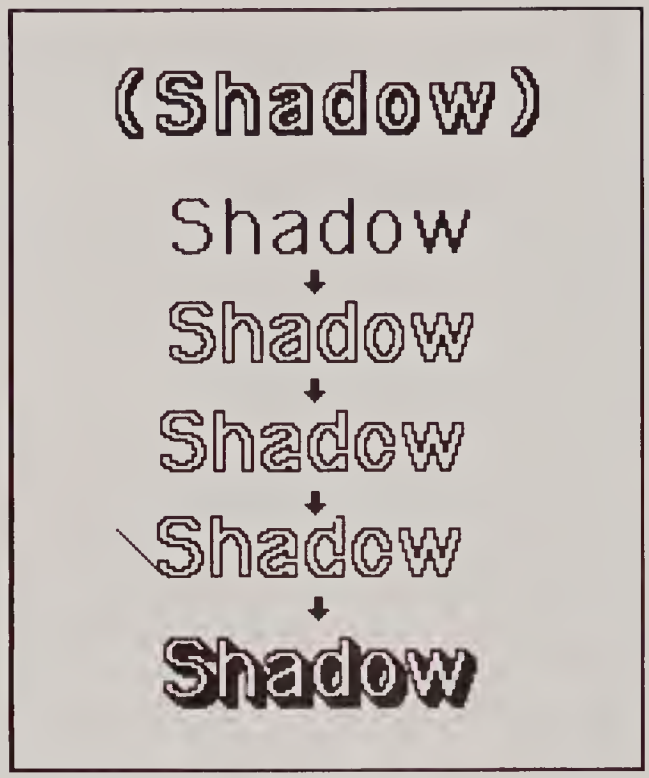
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New Shadow

The intricate but effective procedure shown here enables you to create shadowed text far superior to MacPaint*'s Shadow text.*

Casting Shadows *MacPaint* provides shadowed text, but with a little work you can produce a more attractive version. Reader Sigurd A. Johnson suggests this method. Type a word or phrase in plain or bold text, select the text with the marquee, and choose Trace Edges from the Edit menu. Make openings in the hollow portions of letters such as *a* and *o* (see "New Shadow"). Draw a guideline at a 45-degree angle from the first letter (use the Shift key and the line tool). Then, lasso the text and the guideline, hold down the Option key, and drag a copy of the text one pixel up the guideline. Release the Option key, then repeat this step until the shadow is dark enough. Touch up the text as needed and you have a superior style of shadowed text.

Finding Secret Characters Here's an ancient item of Mac esoterica: hold down the Shift and Option keys and press the tilde (~) key to invoke secret pictorial characters that vary from font to font.

Selection Tools

Most *MacPaint* users are familiar with the basics of using the marquee and the lasso. The following tips present several advanced (or at least esoteric) selection tool techniques.

Closing the Loop Selecting a complex shape with the lasso can tax the motor skills of even the most coordinated buckaroo. But once you've surrounded the major part of an object, releasing the mouse button causes the lasso to zip in a straight line from the end point to the starting point of the encircling line, closing the loop.

Copying Selectively If you select an object with the marquee and cut or copy it, it will be selected with the marquee when subsequently pasted in. To avoid copying the white space around an object, select it with the lasso; it will be lasso-selected when pasted into a document.

Shrink-to-Fit Pasting Select an area on the screen with the marquee. A pasted image will stretch or shrink to fit into the designated area. This technique applies to text pasted from word processing programs as well.

Lassoing by Remote Control The lasso changes to the arrow pointer while you're moving a selection. The arrow may obscure all or part of a small selection, making it difficult to precisely position an object. You can activate a "remote control lasso" by lassoing an object and moving the lasso pointer to the bottom-left corner of the drawing window, carefully positioning it until the pointer turns into an arrow. Hold down the mouse button and move the arrow; the selected object follows along.

Layering Transparently To make an object "transparent," allowing background objects to show through, cut a 1-pixel hole in the object's outline, lasso the object, and drag it into position over the desired background. Fill in the pixel if necessary.

Copying and Copying Lasso an object, hold down the ⌘ and Option keys, and drag it to produce a string of copies. The faster you drag, the farther apart the copies are spaced. The line width selected also affects how closely copies are spaced: the thicker the line, the bigger the space between copies.

Custom Tools

Over the years, *MacPaint* artists have come up with enterprising solutions to some of the program's limitations. Here are several ways to customize *MacPaint* tools.

Choosing the Right Eraser You may find *MacPaint*'s quarter-inch-square eraser too large and cumbersome for deleting details. On the other hand, you may

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find it too small for erasing large expanses of erroneous artwork. Solutions exist for both problems. To create a small eraser, simply select a brush shape and choose white from the pattern palette. The result is a custom eraser for detail work. To quickly erase large areas, select the rectangle tool, no border, and white from the pattern palette. Open up a white rectangle over the area you wish to delete.

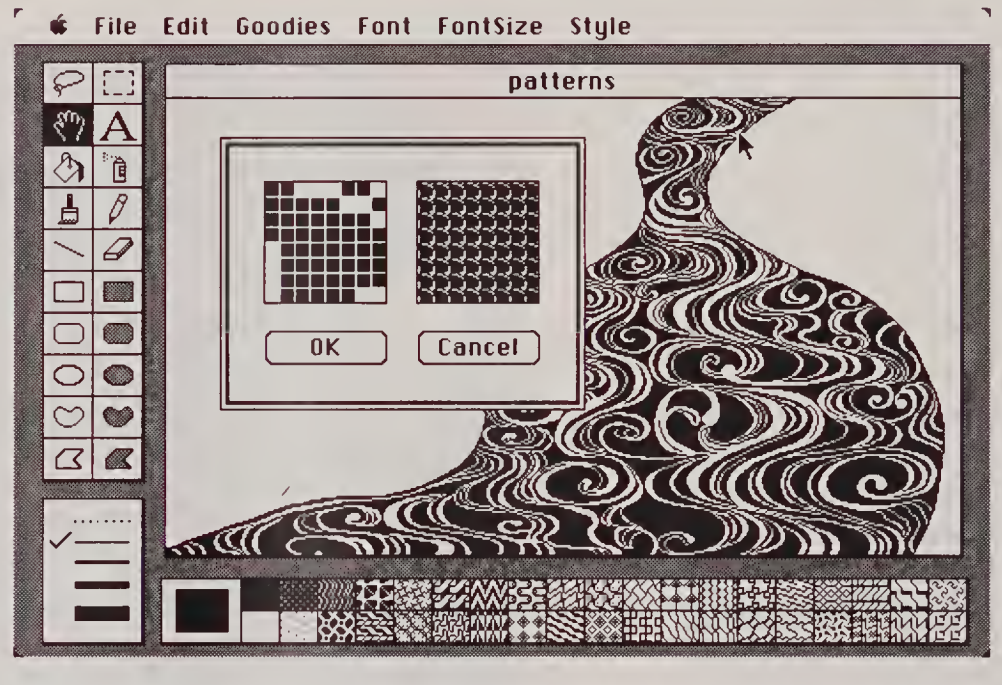
Brushing Up You can create custom brushes in *MacPaint* with the following simple but somewhat inelegant trick. Draw a brush shape with any of *MacPaint*'s tools. Lasso the shape, then press the Option and ⌘ keys and drag the shape as you would any standard *MacPaint* brush. Store a library of custom brushes in the Scrapbook if you wish to use them later. (You can edit *MacPaint*'s built-in brush shapes with Apple's resource editor, *ResEdit*. For details, see "Mining the Mac's Hidden Resources," *Macworld*, July 1985.)

As you probably know, *MacPaint* lets you edit patterns to create a personalized pattern palette that can be saved along with a document. You can do more than just edit patterns, however.

Customizing Patterns Rather than edit a pattern pixel by pixel until you like the results, you can flip through an array of patterns and choose those that suit you. First, place a drawing on the screen; even a randomly scribbled sketch will do. Then, open the Edit Pattern window by double-clicking on any pattern. Click the arrow pointer anywhere on the drawing; the selected pattern will appear in the Edit Pattern box (see "Pointing for Patterns"). Keep clicking until you see a pattern you like, then click OK to record it.

Holding Patterns To keep a pattern intact when elongating an object, use Bill Atkinson's "three-finger stretch": choose the Grid option, select one end of the object with the marquee, hold down the Shift, Option, and ⌘ keys, and stretch the object.

(continues)



Pointing for Patterns
Open the Edit Pattern window and click anywhere on the screen to automatically pick up patterns.

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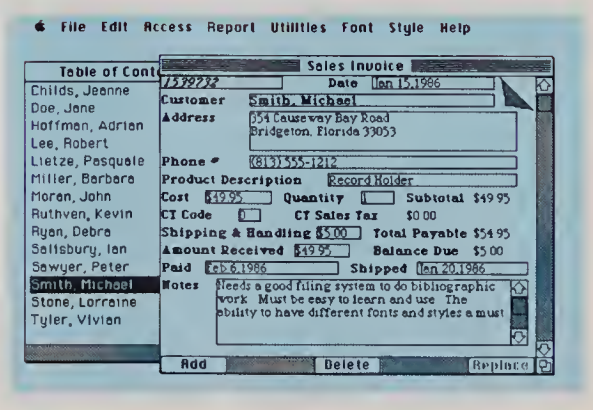
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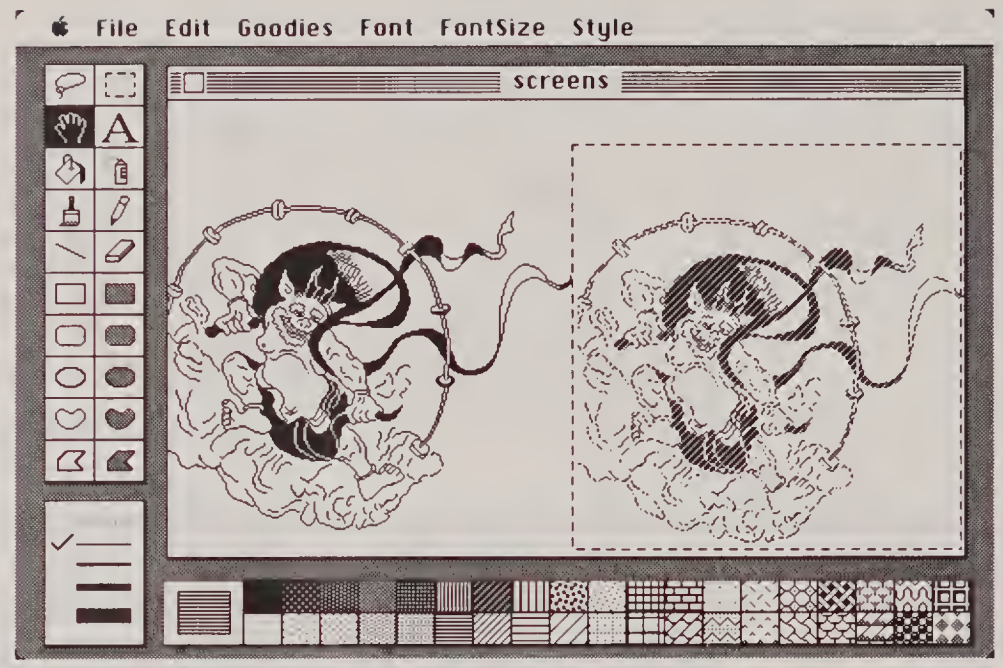
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Layering Paint To produce transparent paint, or "watercolors," in *MacPaint,* hold down the ⌘ key while drawing with the shape tools, the spray can, or the paintbrush. Underlying patterns show through when you apply additional patterns.

Screening Images You can use transparent paint to create a "screen," or overlay. With the marquee, select the area you wish to screen. Select Invert from the Edit menu. Select a pattern, then hold down the ⌘ key and cover the entire inverted area with a filled rectangle. Reselect the area, choose Invert again, and inspect the results (see "Screen Test"). Experiment with different patterns until you achieve the effect you want.

Drawing with Patterns If you hold down the Option key while drawing with the shape tools or the straight line tool, the lines or shape outlines will be drawn in the currently selected pattern, rather than in black.

Pouring Patterns The paint bucket fills black areas as well as white areas with the selected pattern. With a little practice, you can even fill a 1-pixel-wide line with a pattern. Keep in mind that the tip of the paint pouring from the bucket is the paint bucket pointer's "hot spot," or active area.



Screen Test
Use MacPaint*'s transparent paint capability to add patterned overlays to a drawing.*

Resizing and Patterns *MacPaint* lets you shrink or enlarge an object and keep its proportions intact: surround the object with the marquee, hold down the Shift and ⌘ keys, and drag the object to the desired size. Resizing an object in this way tends to distort patterns, however. Therefore, you should draw an outline, if appropriate, then make sure the object is the right size before adding patterns.

Shortcuts

MacPaint's Short Cuts window points out time-saving techniques such as double-clicking the eraser to erase an entire screen. Here are several undocumented shortcuts.

Erasing To quickly delete an area selected by either the lasso or the marquee, press the Backspace key. To quickly

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erase an area larger than *MacPaint*'s drawing window, select Show Page, place the pointer outside the dotted rectangle that represents the drawing window, and drag the unwanted section of the drawing off the page (be careful—you can't undo this action).

Zooming In To enter FatBits in a flash, hold down the ⌘ key and use the pencil to click the area you want to zoom in on.

Scrolling Instantly The hieroglyphs in *MacPaint*'s Short Cuts window point out that holding down the Option key while using the pencil scrolls the screen in FatBits (the pencil turns into the hand, or "grabber," tool). Short Cuts fails to mention that this handy maneuver also works in the full-size drawing window.

File Management

MacPaint pictures can take up quite a bit of memory. The following tips should make life a little easier for floppy disk users. (File-compression utilities such as *Packer* and *PacPaint* can also help you conserve disk space.)

Conserving Disk Space Even a minimalist *MacPaint* document consisting of a single pixel takes up 2K of disk space. If you need to conserve disk space, consider storing small illustrations together in a single document, thus avoiding the 2K-per-document overhead.

Planning Ahead You may encounter the dreaded "disk full" message even though to all appearances you have plenty of disk space. However, two files are created behind the scenes when you work on a *MacPaint* document. These files, called Paint 1 and Paint 2, store duplicates of the current document, allowing you to return to an earlier version via Undo or Revert. Since Paint 1 and Paint 2 are the same size as the document you're working on, and a *MacPaint* picture can be as large as 50K or so, a single document in progress can take up more than 150K of disk space. If you know you'll be working on a large, intricate drawing, remove any extraneous documents from your disk before beginning.

Cutting and Pasting

You may want to integrate *MacPaint* artwork with text or graphics from other programs. Some cutting and pasting advice may help.

Adjusting Margins When a *MacPaint* picture is pasted into a *MacWrite* document, the picture automatically shrinks, if necessary, to fit within the confines of the document's margins. If you wish to paste in the full-sized picture, insert a new ruler in *MacWrite* and adjust the margins before pasting.

Positioning an Image When a *MacPaint* graphic is pasted into a *MacWrite* document, it lines up with the document's left margin. To center the picture, click anywhere on it and drag it by the border that appears. Be careful not to drag one of the small squares, or "handles," on the border; doing so will resize the graphic. To add space above or below the image, use Return or Backspace to add or delete lines.

Getting the Big Picture *MacPaint* limits you to cutting or copying an area the size of the drawing window. Several accessory products—*Paint Cutter, Art Grabber,* and *QuickPaint*—allow you to cut or copy *MacPaint* documents as large as 8 by 10 inches. An alternative is to copy screenfuls of a *MacPaint* document into *MacDraw,* combine the segments, and group them into a single image. The entire image can then be copied from *MacDraw* into other applications.

Printing

There's more to printing *MacPaint* documents than meets the eye. A few tricks will help you get the most out of your printer.

Setting Standards Many *MacPaint* artists, accustomed to the simple choice between Print Draft and Print Final, become confused when confronted with the many ImageWriter printing options available in *MacWrite*. The following summary of printing possibilities should help clarify matters. Draft doesn't print graphics at all. Faster (formerly Standard) prints both text and graphics at a medium density; this option is a good choice for printing text-and-graphics documents. In Best (formerly High) quality, the ImageWriter I doubles the font size, then scales it down, printing twice the number of dots per inch, making letters dark and dense. This technique doesn't work as well with graphics, which are enlarged and then thinned; illustrations appear lighter than the accompanying text when printed in Best mode and are often noticeably distorted. The Image-

(continues)

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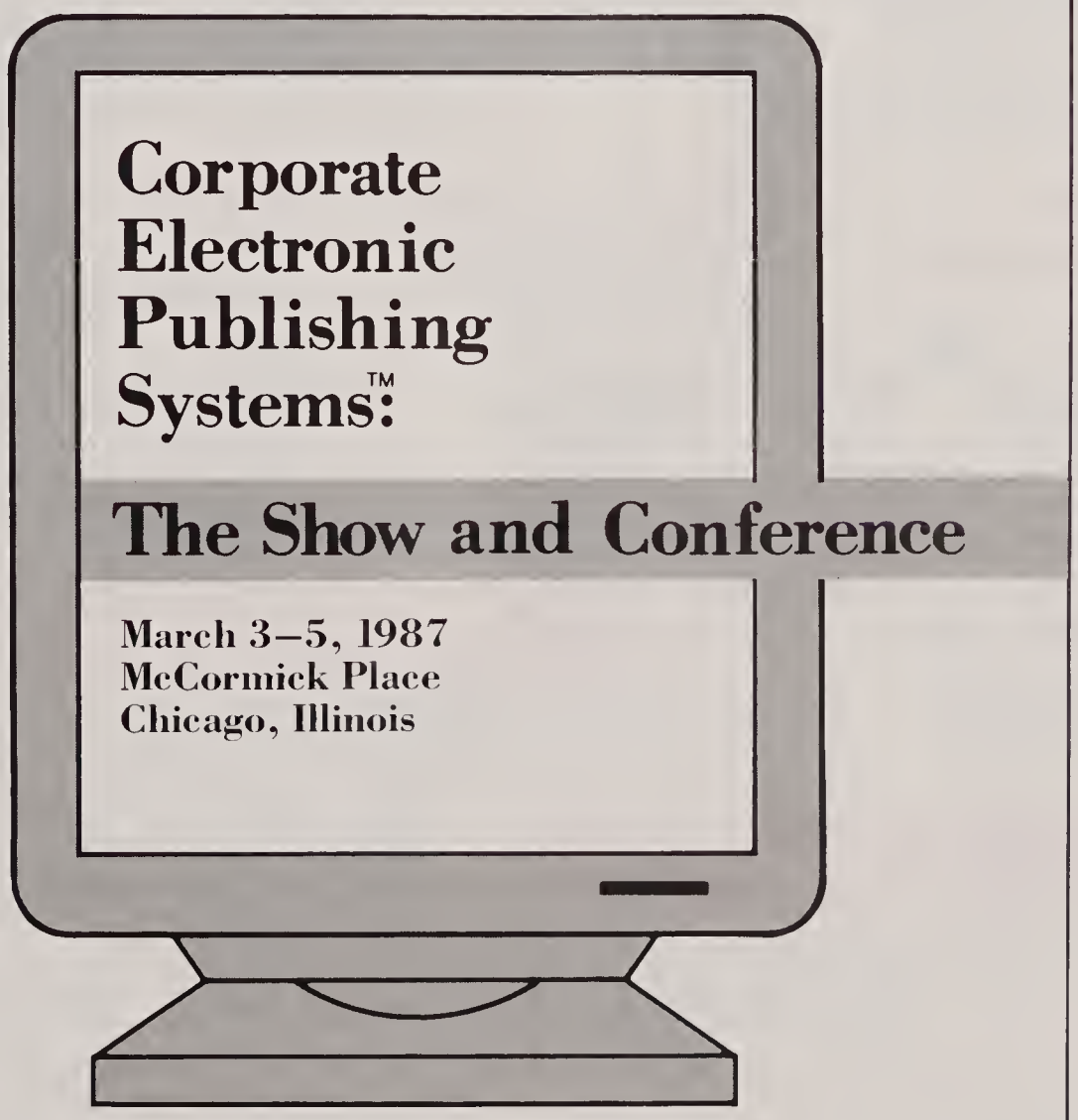
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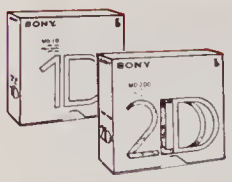
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Writer II, which prints smaller dots than the ImageWriter I, works fine with graphics in Best mode.

Elliptical Comment You may notice that when a *MacPaint* drawing is pasted into *MacWrite* and printed on the ImageWriter, circles appear somewhat elongated vertically (this syndrome is known to Mac aficionados as the El Greco Effect). To rectify this distortion, choose Tall Adjusted from the options presented in the Page Setup dialog box. Circles will then be round when printed. (Unfortunately, Tall Adjusted widens text as well as graphics by about 13 percent. You'll have to decide if you want to trade slightly stretched text for more accurate circles.)

Printing in Triplicate *MacPaint* uses its own printer driver. Unlike *MacWrite* and many other Mac applications, *MacPaint* does not provide the option of printing multiple copies of a document. There is a clever way to print multiple copies of a *MacPaint* document from the Finder, however. Select the document from the Finder, then repeatedly select Duplicate from the File menu until you have as many copies as you wish to print (or until you run out of disk space). Finally, select the entire collection of copies and choose Print.

Ejecting Back Seat Drivers Because *MacPaint* uses its own printer driver, owners of 128K and 512K Macs (with System 2.0 and Finder 4.1) can save valuable disk space by removing the ImageWriter driver from the *MacPaint* disk. (Keep in mind that this tip does not apply to the 512K Enhanced or the Mac Plus.)

Laser Printing As a rule, *MacPaint* graphics printed on the LaserWriter look best when printed at a reduced size. Since *MacPaint* has no provision for printing reduced images, paste your artwork into an application such as *MacWrite* or *MacDraw* to take advantage of the LaserWriter's scaling capabilities. (As mentioned earlier, these applications also give you access to laser fonts as opposed to bit-mapped characters.) For best results, set the Reduce option in the Page Setup dialog box at 50 or 25 percent. Selecting other percentages results in distorted patterns. □

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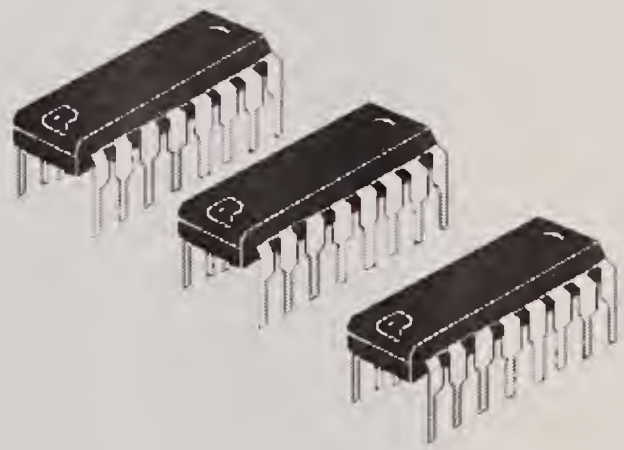
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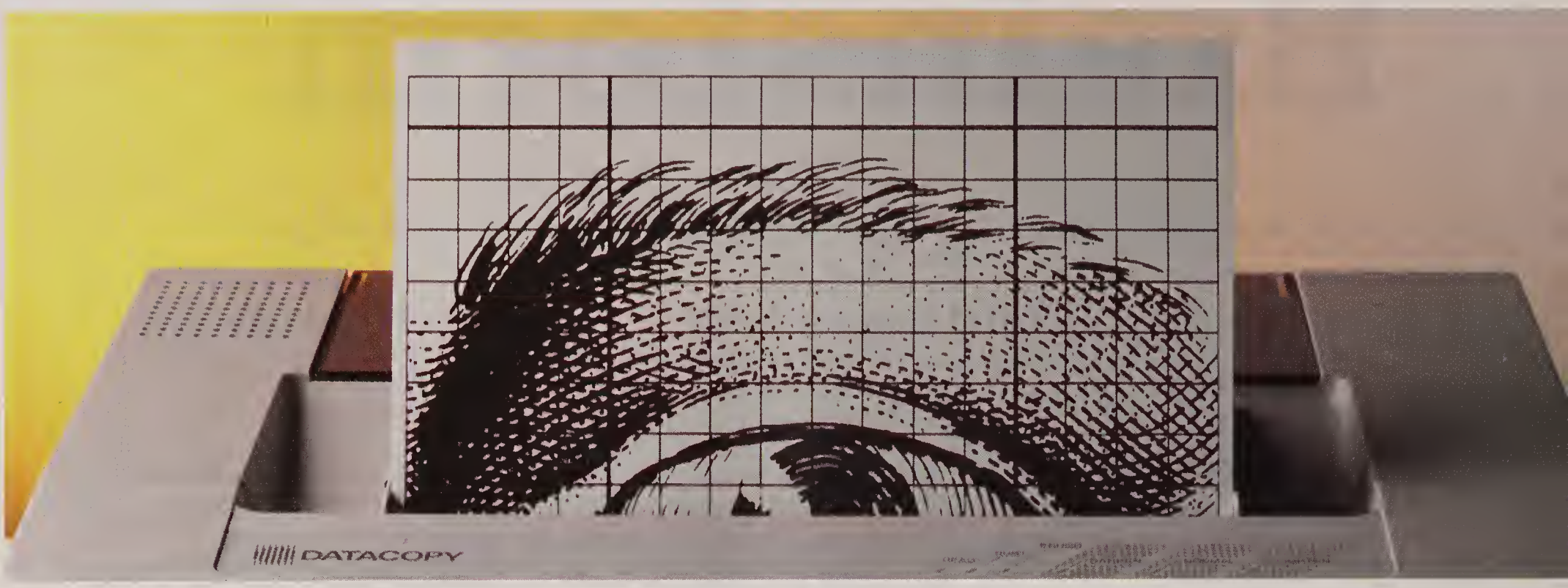
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Mac Tax Tools

Three ways to face the rigors of tax planning and 1040 preparation

by Steve Mann



JEFFERY NEWBURY

Few people like taxes. Tax attorneys, of course, enjoy advising well-to-do citizens on their tax shelters. Some CPAs depend on tax-return preparation for much of their business. But the rest of the human race has an almost innate fear of, loathing for, and frustration with the IRS.

The problem, which won't go away, is not just preparing tax returns. There's the work required to collect your annual tax data in preparation for actually doing your taxes. There's the pain of forking over your hard-earned cash to the government. Finally, for people who are a bit more enterprising, there's long-range tax planning—trying to project your tax situation a few years into the future.

With the right software tools, all of these tasks (except for paying) can be reduced from a mind-numbing nightmare to a brief wrestling match. Although there is not an abundance of tax preparation, planning, and management software for the Macintosh, you should be able to find a product or two to help.

Three Steps to Tax Happiness

Throughout the year, everyone deals with tax-related financial transactions. An obvious example is the amount of federal tax that is withheld from your paycheck. If you track these items with the appropriate software, it's much easier to collect the right data to prepare your taxes. This type of software, which replaces the old shoebox full of receipts, is often called *personal financial management* software.

After the collection step, you calculate all the numbers required for your tax returns. Once you've got the numbers, you plug them into the appropriate forms and send off your return to the federal and state tax authorities. Programs that lighten this burden are called *tax preparation* software.

Finally, you may want to try looking into the future. By using *tax planning* or *tax forecasting* software, you can estimate your tax liability for one or more future years or compare alternate scenarios for the same year. These programs rely on educated guesses about future tax regulations, coupled with one or more years of your financial history, to arrive at their estimates.

The Hard Way Versus the Easy Way

At their simplest level, all three of these tasks are merely a matter of tracking information and calculating numbers. You can build your own spreadsheet templates for record management, tax preparation, and tax planning, though the last two jobs require a thorough knowledge of the tax regulations—no small feat. You can modify such templates as needed to suit your own special requirements.

If you lack the skill or time to craft your own templates, you can purchase one or more ready-made. A variety of *Multiplan* and *Excel* templates is available. One

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good source of *Excel* templates is the *Excellent Exchange* from Heizer Software. Heizer has a catalogued collection of more than 200 *Excel* templates, all reasonably priced. The latest catalog includes templates for personal financial management, tax preparation, and tax planning. For $4 Heizer sends you a sample disk that includes the latest catalog, demo versions of 15 templates, and a free "template of the month." By January Heizer should have a set of 1986 tax preparation templates.

Several other companies also specialize in products for record management, tax preparation, and tax planning. Most of the applications are stand-alone, but a few of the tax preparation products are spreadsheet templates.

Personal Financial Management

Personal financial management is not just the process of storing financial information and preparing it for tax time, although that's the major concern of this article. Different programs offer a variety of other functions like budgeting, check writing, net-worth analysis, investment tracking, checkbook reconciliation, and retirement planning.

Typically, you use such programs to define income and expense categories. Throughout the year, you enter each transaction and classify the dollars earned or spent in one or more appropriate categories. At the end of the year, at least in theory, all you have to do is print out a complete report of tax-related events and plug the numbers into your tax forms.

Dollars and Sense Probably the most popular Macintosh program for personal financial management is Monogram's *Dollars and Sense*. The program includes a predefined set of transaction categories specifically designed for tax preparation. When you use these categories, you assign all or part of each transaction's dollar amount to the appropriate categories. For instance, when you receive interest on your checking account, you identify it as taxable interest income.

At the end of the year, you can print a report that contains only tax-related transactions. Taxable interest income, shown separately on the report, is then included in Federal Schedule B, Interest and Dividend Income.

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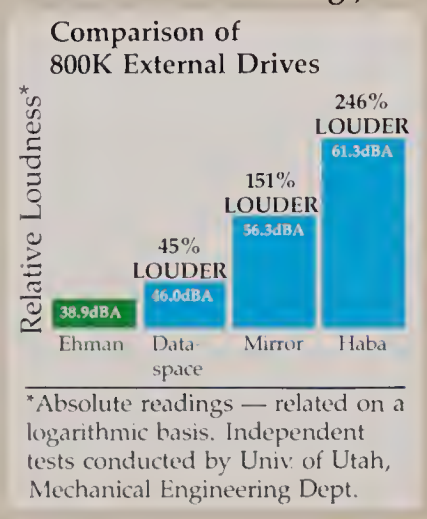
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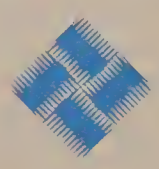


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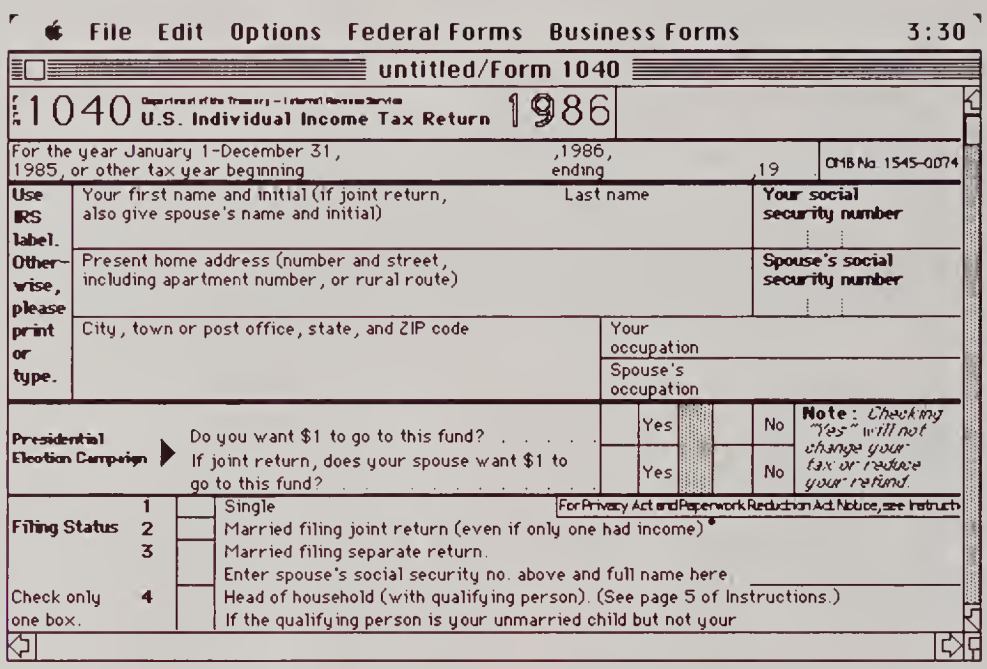
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Look-Alike Forms
Each MacInTax *data entry window looks almost exactly like the corresponding IRS form. You simply tab through the various fields, filling in the appropriate numbers.* MacInTax *calculates everything but the filled-in numbers.*

Several other Macintosh personal financial programs—for example, *Home Accountant, Personal Accountant,* and *MacMoney*—let you track taxable income and expense categories. The program mechanics differ, but the end result is the same.

The problem with this approach to advance tax preparation record keeping is that the results are only as good as your understanding of how to classify various transactions and your ability to enter the data accurately. For example, if you don't know which items are legitimate Schedule A miscellaneous deductions, you're probably either missing or overstating the amount. Likewise, if you enter figures improperly or accidentally choose incorrect categories, your final totals for each category will be wrong.

The old adage "Garbage In, Garbage Out" applies—check your work. It's foolhardy to take any detailed year-end report and merely transfer the grand totals to your tax forms. A few minutes spent scanning your report for mistakes or unusual items may save lots of trouble later on if you're audited.

Tax Preparation Software

Once you've organized your tax records, the next step is to prepare your tax return. Depending on your situation, that may be simple or complicated. If your taxes are straightforward, it may cost less to go to a professional tax preparation service than to buy one of the programs mentioned here. However, if you have any complicated requirements, are a professional tax preparer, or generally prefer to do it yourself, you should be able to find a suitable product.

MacInTax Mac tax preparation programs come in two varieties—stand-alone and spreadsheet templates. The most popular stand-alone Mac program is *MacInTax* from SoftView. *MacInTax* sets a new standard for tax preparation software for two reasons. First, it displays accurate replicas of the actual IRS forms on screen as you enter tax data (see "Look-Alike Forms"). This makes it easier to understand what you are doing in relation to the final IRS requirements. Second, *MacInTax* is the only Mac tax package to print all IRS-approved forms on either an ImageWriter or a LaserWriter.

MacInTax is easy to learn and use, assuming you know something about filling out tax forms. If your data is properly organized, you can complete a multiform tax return in less than an hour. The 1986 version includes quite a few forms, and SoftView also has a California state supplement. In addition, in 1987 various third-party accounting software vendors will provide interfaces to *MacInTax* so you can automatically import your accounting data into *MacInTax,* eliminating some of the usual record-keeping headaches.

J.K. Lasser's Your Income Tax The other stand-alone tax preparation program, introduced in February last year, is *J.K. Lasser's Your Income Tax.* Instead of working with facsimiles of IRS forms, *Your Income Tax* has you fill in windows that just contain IRS line numbers. It's a bit more confusing than *MacInTax.* In addition, your final output must be printed on computer-fed IRS forms using an Image-

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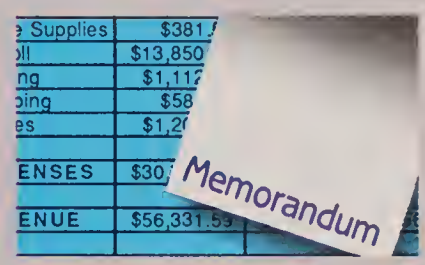
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Writer, which forces you to worry about paper alignment and the like. The program includes a free copy of the book *J.K. Lasser's Your Income Tax.*

EZTax-Prep *EZTax-Prep* is one of the more popular spreadsheet-based tax preparation products. It comes in *Multiplan, Excel,* and *1-2-3* versions. The *Excel* version not only prepares your taxes but also supplies useful graphics displays of certain tax-related information. *EZTax-Prep* includes a wide variety of federal forms, all of which are IRS-approved except the 1040 form. The 1040 must be either printed on special preprinted, computer-fed 1040 paper or photocopied onto blank paper using a 1040 transparency (the program includes both the preprinted forms and the transparency). EZWare also offers California, New York, and Pennsylvania state versions, which automatically import applicable data from the federal template.

TaxEase, from James and Associates, is an unassuming set of templates that come in *Excel, Jazz,* and *Multiplan* versions. It does not calculate many different IRS schedules, but the set it produces should be adequate for most people, and it prints on the standard IRS forms. *TaxEase* also has some facilities for comparing multiyear scenarios.

Tax Planning

Tax planning is the process of estimating or forecasting your tax liability for the current year, using partially estimated data, or for future years, using a set of assumptions. Let's say you anticipate changing jobs in 1987. Your new salary will be substantially larger than your current one, and you're thinking about buying a house to increase your itemized deductions and offset your larger income. Tax planning can tell you the effect of all these variables on your 1987 tax liability.

More ambitious tax planning software might allow you to compare, side by side, different scenarios for the same year or different years. Unfortunately, tax regulations change almost annually; it's difficult for software vendors to keep up with all the nuances, particularly for the future. The net result is that for multiyear forecasting, the numbers usually are at best an estimate. You're often required to enter some of the tax calculation information yourself.

Forecast Monogram's *Forecast* operates as either a stand-alone product or in conjunction with *Dollars and Sense.* It

(continues)

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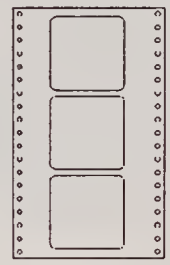
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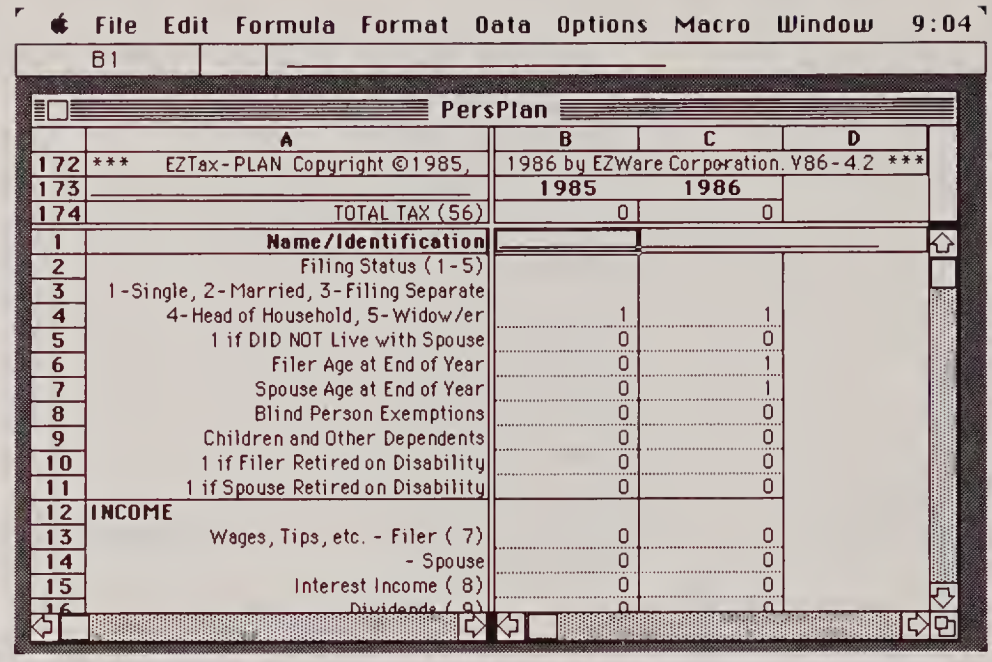
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A Taxing Template *The primary template for* EZTax-Plan *requires you to enter tax information for your base-year tax return (1985 in this case). Using that information, it estimates one or more future years using assumptions you can change.*

helps you examine any number of tax alternatives, five at a time, for the current year or future years. To use *Forecast,* you enter a variety of information, like wages and deductions, or import that data from *Dollars and Sense.* You can then create different alternatives and examine their variations side by side. You control all the relevant parameters needed for tax calculations so you can adapt the program to forecast future years.

EZTax-Plan EZWare, maker of *EZTax-Prep,* also offers a tax planning template for *Excel* and *Multiplan.* Like *Forecast, EZTax-Plan* works as a stand-alone set of templates, or you can import your actual tax data from *EZTax-Prep.* Set up to estimate your current-year taxes based on last year's tax return (see "A Taxing Template"), these templates can be extended to include additional years and calculate future-year taxes using preset growth rates or rates that you define. You can also use *EZTax-Plan* to examine multiple alternatives for one year. EZWare offers both personal and professional versions of these templates.

TaxCalc Tax Planner *TaxCalc Tax Planner* is another *Excel*-based set of templates that lets you compare up to three alternatives for the current year only. You can use it throughout the year to double-check your potential tax liability for those alternatives. Although a bit less ambitious than *Forecast* and *EZTax-Plan, TaxCalc* is appropriate for many people. TaxCalc Software also offers a variety of financial planning templates.

The IRS in All This

Tax preparation and planning, and to a lesser extent financial record management for tax purposes, can be both time-consuming and irritating at first. Once you get into the habit of using your Mac for these three tasks, though, the benefits can far outweigh the headaches. There's something comforting about knowing in July roughly how much you'll owe the IRS the following January; surprises, especially when the IRS is one of the interested parties, can be obnoxious. You can also reduce your tax preparation time to a minimum, avoiding the last-minute rush on April 15.

Tax software is not a substitute for professional advice. There have been legislative mutterings lately about defining specific liability for tax preparation software vendors whose products give "expert" tax advice; you can be sure that software vendors are listening carefully. In order to use any of this software effectively, you need to know something about the tax laws. With the ever-changing regulations, if you have any uncertainty about your understanding of the rules, consult a tax professional.

Every software vendor mentioned here is at the mercy of the IRS, just as the taxpayers are, but in a different way. Before they can produce the current-year version of their various products, they must get up-to-date information from the IRS—information that may not be available until December. Don't be surprised if some of these vendors haven't updated their products by January 1. Some of the final versions arrived quite late in the tax season last year, but I expect the companies to be more punctual this year because they know they can't survive otherwise. Be a little patient if possible—we're all in the same boat. Guess who's the captain? □

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Updates

This list brings you highlights of software recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

Business Filevision version 1.1 removes copy protection, supports more font sizes and styles, improves calculation, and imports and exports files in standard file-exchange formats. Telos Software Products, 3420 Ocean Park Blvd., Santa Monica, CA 90405-3395, 213/450-2424. Free; $395 new.

Consulair Mac C/Mac C ToolKit version 5.0 adds Pascal function type, allows precompiled header files, and doubles the speed of the C compiler and the linker. The improved editor includes an Undo feature, and there's increased support for symbolic debugging. Consulair Corp., 140 Campo Dr., Portola Valley, CA 94025, 415/851-3272. Cost of upgrading ranges from $20 to $150, depending on which version you have now; $425 new.

Cricket Graph version 1.1 is HFS compatible; it imports PICT-format images directly from the Clipboard, transposes rows and columns, adds new drawing shapes, and quadruples the number of categories to 64. Cricket Software, 3508 Market St. #206, Philadelphia, PA 19104-3311, 215/387-7955. Free with proof of purchasing the original version after September 15, 1986, $10 if purchased before then; $195 new.

MacDraft version 1.2A removes copy protection, does area calculation, allows editing of patterns, and saves in PICT format. Request upgrade by mail. Innovative Data Design, P.O. Box 27666, Concord, CA 94527-0666, 415/680-6818. Free; $269 new.

MacFill-In version 1.1 supports the Mac cursor keys, speeds up scrolling, and allows you to print data on preprinted forms. Cognitive Concepts, 1219 Phelps Ave., San Jose, CA 95117, 408/243-6886. Free with original disk; $39 new.

MacSpell+ version 1.67 corrects typos in its dictionary, allows checking of *Microsoft Word* documents wider than the screen, lengthens the "ignore" word list to 500 words, and supports *Microsoft Works*. Creighton Development, Inc., 16 Hughes #C-106, Irvine, CA 92718, 714/472-0488. Original disk plus $15; $99 new.

RamStart version 1.3 is HFS compatible and fixes a bug that caused some files to be forgotten when many files were copied to the RAM disk. Written by George A. Nelson, available via on-line services and user groups such as the Boston Computer Society, One Center Plaza, MA 02108.

X-10 Powerhouse Home Control version 2.0 is faster, easier to use, and HFS compatible; it allows you to redraw the background and the icons for a custom look. X-10 (USA), Inc., 185A Legrand Ave., Northvale, NJ 07647, 800/526-0027, 201/784-9700 in New Jersey. Original disk plus $5; $79.99 new, including Home Control Interface. □

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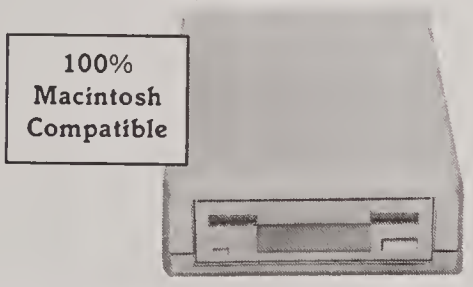
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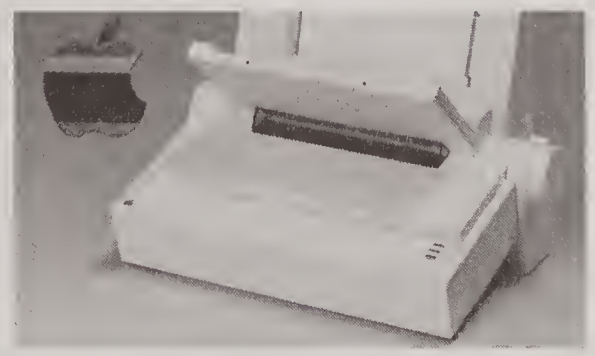
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The Macworld Directory is a comprehensive listing, by category, of products and services available for the Apple Macintosh. It provides advertisers with a low-cost advertising alternative and our readers with an easy reference guide.

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Version 1.0. Compu-Teach, Inc., 240 Bradley St., New Haven, CT 06511, 203/777-7738, 800/448-3224. 128K minimum memory. $39.95.*

BPI Entry Series General Accounting
Version 1.00. BPI Systems, Inc., 3001 Bee Cave Rd., Austin, TX 78746, 800/531-5252. 512K minimum memory; external drive recommended. $425.*

Calliope
Version 1.3. Innovision, P.O. Box 1317, Los Altos, CA 94023-1317, 415/964-2885. 512K minimum memory. Version 1.4 now available, free to registered owners. $59.95.*

Cap'n Magneto
Public domain software, also available from PowerTools, 1206 Karen Ave., Austin, TX 78757. 128K minimum memory; 512K or Plus recommended. Send $20 and a blank disk, or $30 (without disk).*

Cricket Draw
Version 1.0. Cricket Software, 3508 Market St. #206, Philadelphia, PA 19104, 215/387-7955, 800/345-8112, 800/662-2444 in Pennsylvania. 512K minimum memory plus 128K ROM; LaserWriter recommended. $295.*

Cricket Graph
Version 1.1. Cricket Software, 3508 Market St. #206, Philadelphia, PA 19104, 215/387-7955, 800/345-8112, 800/662-2444 in Pennsylvania. 512K minimum memory; external drive recommended. $195.

Data Port
SuperMac Technology, 950 N. Rengstorff Ave., Mountain View, CA 94043, 415/964-8884. 512K minimum memory; HFS only. $299.*

Deadline Mac
Published by Society of Newspaper Design, Newspaper Center, Box 17290, Dulles International Airport, Washington, DC 20041. Subscription with annual membership $45, students $25.

Design
Version 0.93. Meta Software Corp., 55 Wheeler St., Cambridge, MA 02138, 617/576-6920. 512K minimum memory. $200.*

DiskExpress
Version 1.06. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927, 713/353-4090. 128K minimum memory; 512K recommended. $39.95.*

dMac III
Version 1.10. Format Software, Inc., 11770 Bernardo Plaza Ct. #217, San Diego, CA 92128, 619/487-6946, 800/237-9057, 800/654-0571 in California, 800/361-0431 in Canada. 512K minimum memory; requires external drive. $495.*

Dollars and Sense
Version 1.4. Monogram Software, Inc., 8295 S. La Cienega, Inglewood, CA 90301, 213/215-0355. 128K minimum memory. $149.95.

Dynamac
Dynamac Computer Products, Inc., 1536 Cole Blvd. #252, Golden, CO 80401, 303/233-7626. 1MB RAM with 800K drive $4995. Extra for options such as 4MB RAM, 20 or 40MB internal drive, or 300/1200-baud internal modem.*

Easy As ABC
Springboard Software, Inc., 7808 Creek Ridge Circle, Minneapolis, MN 55435, 612/944-3915. Not copyable. 128K minimum memory. $49.95.*

Excellent Exchange Tax Templates 1986
Heizer Software, 5120 Coral Ct., Concord, CA 94521, 415/827-9013. 128K minimum memory. $25.

EZTax-PLAN
1987 version. EZWare Corp., P.O. Box 620, 29 Bala Ave., Bala Cynwyd, PA 19004, 215/667-4064, 800/543-1040. 128K minimum memory; external drive recommended. Personal edition $95, business edition $295.

EZTax-PREP
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Fancy Fonts
Version 1.0. Genny Software Research and Development, P.O. Box 5909, Beaumont, TX 77706, 409/860-5817. 128K minimum memory. $49.95.

FastPort
Mirror Technologies, 2209 Phelps Rd., Box 304, Hugo, MN 55038, 612/426-3276, 800/328-6795 ext. 428 (orders only). 512K minimum memory; 512KE recommended. $149.*

Fluent Fonts
Version 1.1. Casady Company, P.O. Box 223779, Carmel, CA 93922, 408/646-4660, 800/331-4321, 800/851-1986. 512K minimum memory; external drive recommended. $49.95.

FONTastic
Version 2.7. Altsys Corp., 720 Avenue F #108, Plano, TX 75074, 214/424-4888. 128K minimum memory; 512K or Mac Plus recommended. $49.95.

Fontographer
Version 2.1. Altsys Corp., 720 Avenue F, #108, Plano, TX 75074, 214/424-4888. Intermittent key-disk copy protection; installs on hard disk. 512K minimum memory; two drives recommended. $395.

Forecast
Version 1.4. Monogram Software, Inc., 8295 S. La Cienega, Inglewood, CA 90301, 213/215-0355. 128K minimum memory. $69.95.

Foreign Language Fonts
Linguists' Software, 106R Highland St., South Hamilton, MA 01982, 617/468-3037. 128K minimum memory for all except MacHieroglyphics; 4 of the 20 sets are LaserWriter-compatible. $49.95 to $149.95.

Geometry
Version 1.0. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101, 415/479-1185. Key-disk copy protection. 512K minimum memory; two drives recommended. $99.95.

Guide
Version 1.00. OWL International, Inc., 14218 N.E. 21st St., Bellevue, WA 98007, 206/747-3203. 512K minimum memory; two drives recommended. $134.95.*

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Version 1.3. Think Technologies, 420 Bedford St. #350, Lexington, MA 02173, 617/863-5590. 512K minimum memory. $295.*

J. K. Lasser's Your Income Tax
1986 version. Simon and Schuster Software, One Gulf and Western Plaza, 14th fl., New York, NY 10023, 212/373-8882, 800/624-0023. 128K minimum memory. $79.95.

Lap-Mac and Flat Mac
Colby Computers, 4723 N. Warren, Fresno, CA 93705, 209/222-4985. $4995 plus options: 20MB hard disk $1499, 40MB hard disk $1995, 60MB hard disk to be announced, DC adapter $595, 68020 board $2995, 68020 board with floating-point co-processor $6995, carrying cases $129-$499, two-button nylon roller $75; 300/1200-baud modem $199, stand-alone box for two hard disks $599.*

LaserPaint Bundle
Knowledge Engineering, G.P.O. Box 2139, New York, NY 10116, 212/473-0095. 1MB minimum memory; HFS only; hard disk and LaserWriter recommended. $1495.

LaserSampler II Font Catalog
MacTography, 702 Twinbrook Pkwy., Rockville, MD 20851, 301/424-3942. $23.95.

LaserType
Version 1.1. Image Club Graphics, 2828 19th St. NE, Calgary, Alberta, Canada T2E 6Y9, 403/250-1969, 800/661-9410 in the United States. 128K minimum memory; Mac Plus, hard disk, and LaserWriter recommended. $34 per font, $149 set of eight fonts, $259 two sets of eight fonts.

Lightspeed Pascal
Version 1.0. Think Technologies, 420 Bedford St. #350, Lexington, MA 02173, 617/863-5590. 512K minimum memory, but more RAM or disk space enhances performance. $125.*

LoDown T-20, T-50
LoDown, 10 Victor Square #200, Scotts Valley, CA 95066, 408/438-7400. 512K. $895, $1295.

MacAtlas
MicroMaps, P.O. Box 757, Lambertville, NJ 08530, 609/397-1611. 128K minimum memory; 512K with external drive or RAM disk recommended. *MacPaint* edition $49; *MacDraw* edition $199.

MacBeLingual
Version 3.2. Ecological Linguistics, P.O. Box 15156, Washington, DC 20003, 202/546-5862. 128K minimum memory; 512K recommended. Send SASE for more information. $30 per alphabet.

MacDraw
Version 1.91 for 400K drives; version 1.0 for 800K drives. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K with two drives recommended. $195.

Maccessories Professional Type Fonts
Version 86/2. Kensington Microware Ltd., 251 Park Ave. S, New York, NY 10010, 212/475-5200, 800/535-4242. 128K minimum memory. $49.95.

MacInTax
1986 version. SoftView, Inc., 4820 Adohr Ln., Camarillo, CA 93010, 805/388-2626, 800/MAC-NTAX, 800/MAC-VIEW in California. 128K minimum memory. Federal edition $99, California edition $45; annual updates: federal $45, California $25.

MacPort+
Peripheral Land, 3677 Enochs St., Santa Clara, CA 95051, 408/733-7600. 512K minimum memory; requires 128K ROM; HFS only. $189.*

MacTablet
Summagraphics Corp., 777 State St. Extension, Fairfield, CT 06430, 203/384-1344, 800/243-9388. 128K minimum memory. 6" by 9" $499, 12" by 12" $599.

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Vampire's Castle (4067) Planetfall and Wishbringer clues.
Rubick's Cube (4068) Core Wars, Brickles.
New Daleks (4069) Outsmart the Robots. Lode Runner Demo, Font Librerien, Star Chart & more.
Modem Games (4075) Telechess, Modem Wers, Billiard Parlor.
Biorhythm (4082) Typist, Space Invaders,& Wheel.
Card Games (4086) Solitaire. A popular card game.
More Card Games (4070)

Educational

Think Ahead 1.2 (4085) Mind Strategy Game, plus Pong and Concentration.
Sargon Chess (4087) Great examples. Must own Sargon™ chess game to play!

Music

Musicworks Files (4016) Songs for use with Musicworks™ such as "The Entertainer", "Yesterday", "Tocatina" etc.
Mac Music Files (4017) Songs for use with Mac Music™. "Billie Jean", "Like a Virgin", "Yellow Submarine", "Close Encounters" & more.
Concertware+ Files (4095) Songs for use with Concertware+.

Desk Accessories

N.S.L. no. (4041) Text Reader, MultiScrapbook, Icon Install, Auto log, and dCad Calculator.
N.S.L. no. (4042) Quick Print, MiniFinder D/A, HP 12C Calculator, Hacker D/A's, D/A Sampler, more.
Hacker D/A's (4044) Abacus, Timer, MemScan, NumCaps, Continuity, MacVision 1.1, Knockout windows.
Hacker Tools (4108) Patchdisk, Purge Icons, Disk Test, Answering Machine, and Fast Disk Copy.
N.S.L. no. (4045) Icon Maker 2.0. (Design your own icons), QuickPrint (Print textfiles while working on other applications), Financial Calculator etc.
N.S.L. no. (4046) Function Key Desk Accessory, Font/DA Mover 3.2, Fkey Installer, Fkey Sampler.
N.S.L. no. (4047) Rolodex, Disk Info, Fun D/A's, Fkeys: Fontsie & Showkey.

Telecommunication

N.S.L. no. (4048) Use your modem concurrently while working on other programs. MockWrite, MockTerminel, MockPrint. Disk Info D/A's: Checksum, Utilities 2.0, Disk Info 1.42.
N.S.L. no. (4107) Communication Utilities: Binhex, Appletalk Chat, Cheese Hacker Pack It.

Graphics Desk Accesories

N.S.L. no. (4049) Artisto (Loads MacPaint files), Animator, Read Macwrite D/A, Function Key installer and sample function keys.
N.S.L. no. (4014) Big Ben (clock D/A), Calendar, & Text File Reader.

Disk Catalog Maker

N.S.L. no. (4098) Disk Librarian (Excellent for cataloging extensive libraries. Just run the program and insert disks).

N.S.L. refers to:
National Software Library

Word Processing

Spellcheck (4104) Speller and extensive dictionery for Macwrite and textfiles.
Printer Utilities (4102) WordStar to MacWrite, PageSetup (Create your own page sizes).

Business

'85 Tax Templates (4103) For use with Microsoft Excel™.
Think Tank™ Demo (4105) Outline Processor. A demo version with examples.
Business Programs (4106) Office Manager (Accounts Receivable, prints ledgers, deletes inventory), plus Excel Dep, MultiReg, Parametric Stats.

Languages

Basic Compiler (4101) Complete with documentation end examples.
Smalltalk (4099) Disk elso includes Ada and a 68000 disassembler.
XIisp 1.4 (4037)
McAsm (4033) 68000 Assembler and Linker.

Midi Music Applications

Midi Synthesizer programs.

Midi Term (4117) Midi 2, Midi Mouse, 7th Heaven
CZedit Demo (4118) CZlibrarian (For use with the Casio CZ101™ Keyboerd).

Hacker Tools

Icon Exhanger (4100) DrawPaint 1.0, Tab Util & more.
Redit 1.0 (4012) The European resource editor.
Hacker Files (4096) Fedit 3.5, (Disk block editor, edit in Hex or Ascii).
ResEdit 1.0 (4097) Apples resource editor for the Mac (Most updated version).

MS Basic Programs

N.S.L. no. (4018) Communication Utilities: File Compare, Mac Tep.Mouse, Text Editor, File Splitter, and Terminal 2.0. Other progrems: Fency List, MekeWrite, File Copy, Analog clock and MacAnimation.
N.S.L. no. (4019) Misc. Programs: Font Display, Mac Copt 1.4, Rem Remover, Binary<>Hex, Calculator, Pattern Editor, Disk Dump, and Disk Zap.
N.S.L. no. (4020) Games: Concentration, Orbit, Robot Bettle 1.0, Koch, DRagon, Snowflake, MacBackup & 3D X-Y Plot.
N.S.L. no. (4021) More Games: Phrase-Craze with documentation, Amaze, Yehtzee. Also included (Does not require MS Basic™ to run). Brickles, Silicon Volleyball, and Star Trek Trivia.

Engineering

N.S.L. no. (4119) DesignScope demo version (Simuletion program that helps design component circuitry).
N.S.L. no. (4120) Digital Simuletor (Digital logic simuletor).

Digitized Pictures

N.S.L. no. (4114) Naguels Pert 1 (Collection of sketches by the famous Mr. Naguel). Also includes "Artisto" Desk eccesory for viewing them.
N.S.L. no. (4115) Neguels Part 2
N.S.L. no. (4121) Querk Images

The library contains the most current public domain software. It is updated daily and we are constantly expanding our selection. A free catalog is available upon request. We invite authors to send in new programs. For technical support, feel free to call our Librarian - Luis.

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. . . and many more!

Major programs are listed, however, there are usually more programs on each disk.

Minimum order quantity on PD - 5 program disks

RIBBONS (Minimum 3):		THE "CARETAKERS" ™	
Apple Imagewriter,I,II,Prowriter	2.39	10 pack library case 3.5"	.99
Apple Imagewriter Multicolor	11.99	40 disk storage case 3.5" w/lock	7.99
3.5" DISKETTES (Minimum 30)			
ss/dd-Blue/Beige/Grey	1.39		
ds/dd- Blue/Beige/Grey	1.59	ACCESSORIES	
ds/dd color pack	1.69	Drive head cleaning disk 3.5"	12.99
(red,orange,yellow,green, blue)		Printer stand	29.99

Lifetime warranty on disks. Satisfaction guaranteed or your money refunded within 30 days. Disks packaged in 10's - Min. 30 disks. Checks (allow 10 days to clear), money orders, MC, Visa, AX, C.O.D.(add $1.90). P.O.'s accepted from qualified public institutions, gov't. agencies and well-rated companies, net 30. CA. residents add 6%. For information and free catalog call, (619) 942-9998.

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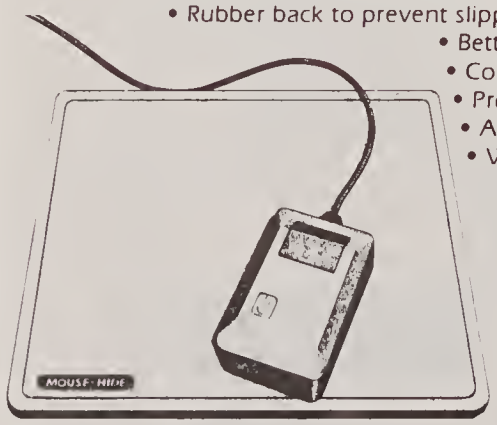
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Where to Buy

MacVideo Cam
Comtrex, Inc., P.O. Box 5500, Newport Beach, CA 92662, 714/673-4200, 800/443-2751 ext. 130. 128K minimum memory. $588, with Genlock $748.*

McCAD PCB Design
Version 31-9. Vamp Inc., 6753 Selma Ave., Los Angeles, CA 90028, 213/466-5533. Key-disk copy protection. 512K minimum memory; two drives recommended. $395.*

Microsoft Excel
Version 1.03. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; requires 800K disk space. $395.

MX Plus
Intelitec, Inc., P.O. Box 844, Fairfield, IA 52556, 515/472-2000. $5000-$7000 depending on options such as 20MB hard disk, internal printer, internal modem, battery or solar charged, electroluminescent or plasma display.

Orbquest
Version 1.02 used by author; version 1.03 now available. Qware, P.O. Box 850415, Richardson, TX 75085, 214/690-6047, 800/843-0381. Key-disk copy protection. 128K minimum memory; 512K recommended. $49.95.*

Organic Fonts
Version 1.1. Modern Graphics, P.O. Box 21366, Indianapolis, IN 46221-0366, 317/253-4316. 128K minimum memory. $79.95.

Packer
Version 1.0. Bobbing Software, 67 Country Oaks Dr., Buda, TX 78610, 512/295-5045. 128K minimum memory. $29.*

PacPaint
Version 1.0. Mainstay Software, 5311-B Deery Ave., Agoura Hills, CA 91301, 818/991-6540, 800/628-2828 ext. 765 (orders only). 128K minimum memory. $39.95.

PressLink
Knight-Ridder Graphics Network, 774 The National Press Bldg., Washington, DC 20045.

Ragtime
Version 1.0. Orange Micro, Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807, 714/779-2772. Key-disk copy protection. 512K minimum memory; requires 800K of disk space. $395.*

SciFonts and ElectroFont
Version 2.5. Paragon Courseware, 4954 Sun Valley Rd., Del Mar, CA 92014, 619/481-1477. 128K minimum memory; 512K recommended. SciFont $49.95, LogiFont $40, ElectroFont Package (includes LogiFont and SciFont) $99.

SMK GreekKeys
Version 2.3+. SMK, 5760 S. Blackstone Ave., Chicago, IL 60637, 312/947-9157. 128K minimum memory. $25.

Soft Palette Fonts
Decision Science Software, P.O. Box 1483, Sugar Land, TX 77487, 713/491-0073. 128K minimum memory. Soft Palette Fonts 1 and 2 $35 each.

Surgeon
Version 1.0. ISM, Inc., 2936 Paper Mill Rd., Phoenix, MD 21131, 301/666-2672. 512K minimum memory. $60.*

TaxCalc Tax Planner
Version 5.0. TaxCalc Software, Inc., 4210 W. Vickery Blvd., Fort Worth, TX 76107, 817/738-3122. 512K minimum memory. $250.

TaxEase
1986 version. James Associates, 1525 E. County Rd. 58, Fort Collins, CO 80524, 303/484-5296. 128K minimum memory. $39.95.

TDBK-20+, TDBK-45
MDIdeas, 1111 Triton Dr. #205, Foster City, CA 94404, 415/573-0580. 512K minimum memory; requires 128K ROM. 20+ $1095, 45 $1295.

Tempo
Version 1.1. Affinity Microsystems Ltd., 1050 Walnut St. #425, Boulder, CO 80302, 303/442-4840, 800/367-6771 (orders only). 512K minimum memory; Mac Plus with hard disk recommended. $99.

TML Pascal
Version 2.0. TML Systems, 4241 Baymeadows Rd. #23, Jacksonville, FL 32217, 904/636-8592. 512K minimum memory; requires 800K of disk space. $99.95.*

UltraFonts
Version 2.0. Century Software, Inc., 2483 Hearst Ave. #175, Berkeley, CA 94709, 415/549-1901 or 213/829-4436. 128K minimum memory. $29.95.

World Class Fonts, Volumes 1 and 2
Dubl-Click Software, Inc., 18201 Gresham St., Northridge, CA 91325, 818/349-2758. 128K minimum memory, 512K for any font over 48-point; two drives recommended. $39 each, both $59.

Public domain software is available through on-line information services, through user groups such as Berkeley Macintosh Users Group (415/849-2684) or the Boston Computer Society's Mac special interest group (617/367-8080), or through mail-order clearinghouses such as Educomp, 2429 Oxford St., Cardiff-by-the-Sea, CA 92007, 619/942-3838 or SoftCore (formerly Public Domain Exchange), 673 Hermitage Ln., San Jose, CA 95134, 408/942-0309. □

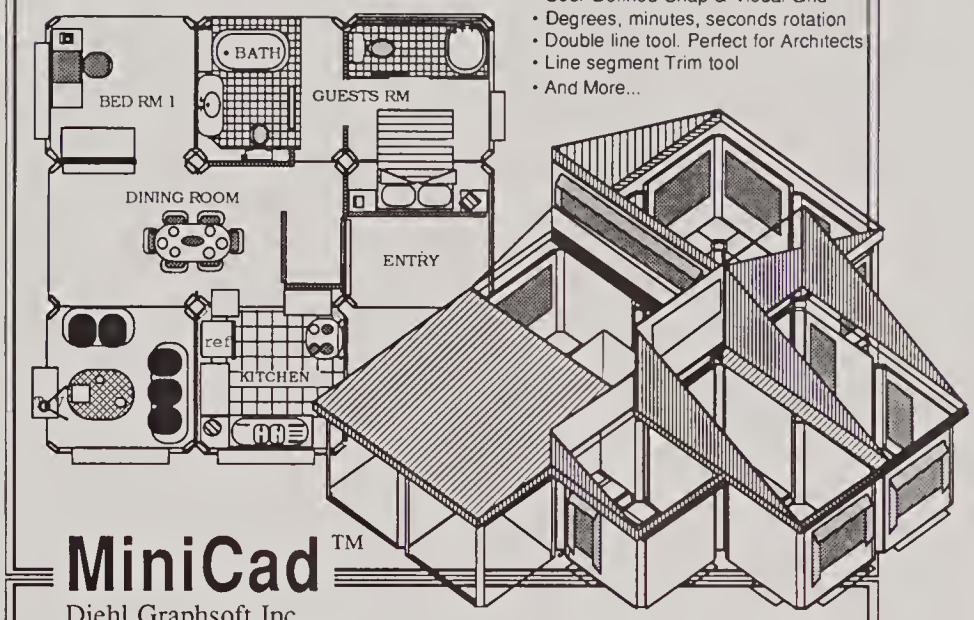
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Macworld Best-Sellers

Business Software

Months on chart	Last month	This month	
20	1	1	**Microsoft Word** *Microsoft*
12	2	2	**Microsoft Excel** *Microsoft*
4*	4	3	**MacWrite** *Apple Computer*
4*	6	4	**MacPaint** *Apple Computer*
8	3	5	**PageMaker** *Aldus*
3	7	6	**FullPaint** *Ann Arbor Softworks*
17	5	7	**MacDraw** *Apple Computer*
1	–	8	**Sidekick** *Borland International*
1	–	9	**Click-On Worksheet** *Borland International*
19	10	10	**Microsoft File** *Microsoft*

Education Software

4	5	1	**Kids' Time** *Great Wave Software*
1	–	2	**Animal Kingdom** *Unicorn*
4	1	3	**Math Blaster** *Davidson and Associates*
4	2	4	**Typing Tutor III** *Simon and Schuster Computer Software*
4	3	5	**MasterType** *Scarborough Systems*

Entertainment Software

4	1	1	**Flight Simulator** *Microsoft*
4	2	2	**MacGolf** *Practical Computer Applications*
3	5	3	**Gato** *Spectrum HoloByte*
3	4	4	**Sargon III** *Spinnaker-Hayden*
1	–	5	**Fokker Triplane** *PBI Software*

Networking/Data Communications

4	1	1	**AppleTalk** *Apple Computer*
4	2	2	**MacServe** *Infosphere*
4	3	3	**Apple Personal Modem** *Apple Computer*
12	4	4	**MacTerminal** *Apple Computer*
4	5	5	**Smartcom II** *Hayes Microcomputer Products*

Hard Disk Drives

Months on chart	Last month	This month	
3	1	1	**Apple Hard Disk 20** *Apple Computer*
4	4	2	**DataFrame 20** *SuperMac Technology*
4	3	3	**HyperDrive 20** *General Computer*
1	–	4	**FX-20** *General Computer*
1	–	5	**AST-2000** *AST Research*

Books

4	1	1	**Excel in Business** *Douglas Cobb, Microsoft Press*
4	2	2	**Inside Macintosh** *Addison-Wesley*
3	3	3	**The Apple Macintosh Book** *Cary Lu, Microsoft Press*
4	3	4	**The Printed Word** *David A. Kater and Richard L. Kater, Microsoft Press*
4	5	5	**Microsoft Macinations** *Mitchell Waite, Robert Lafore, and Ira Lansing, Microsoft Press*

Product Watch

Editors' choice:
Other recent products of particular interest.

MacLink Plus *DataViz* file conversion program

MacMovies *Beck-Tech* video animation program

Turbo Pascal *Borland International* programming language

Source: Exclusive InfoCorp survey of more than one hundred Macintosh retailers and selected mail-order suppliers. Covers sales during October 1986.

*Formerly bundled with the Mac.

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